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Composition of Diesel Engine Exhaust Gas*

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PROBLEMS requiring the assistance of industrial hygienists have been associated with virtually every major industrial advancement. The automobile introduced many industrial hygiene problems not only in its manufacture but also in fields associated with its use, such as the ventilation of vehicular tunnels and the production and utilization of gasoline and lead tetraethyl. Mechanical refrigeration was accompanied by hazards from toxic gases and vapors. Innumerable examples could be given, but the above are enough to indicate the significant rôle of the industrial hygienist in our industrial progress. It is becoming more and more an accepted policy of industry that the effects of new products and developments on the workers and users should be known before their widespread application.

It has been suggested that Diesel engines could be used safely underground, based upon a comparison with gasoline engines, and assuming that (1) the carbon monoxide content of the Diesel exhaust is always low, and that (2) fire and explosion hazards from Diesel fuel are minimized because of its low volatility. In these respects Diesel engines appear less hazardous than gasoline engines whose use underground has been discouraged by the Bureau of Mines and other organizations interested in safety and mining. Therefore, owing to the increased interest in the possible use of Diesel engines as the source of power for haulage equipment in mines and tunnels in this country, and in line with the policy of studying the hazards associated with new developments and applications, the Bureau of Mines has initiated a study of the hazards involved in the use of Diesel engines underground.

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The main phase of this study to date has dealt with the composition of the exhaust gas, knowledge of which is essential to the safe use of Diesel engines underground or in confined spaces. Such information also may be valuable in establishing a basis for the ventilation of vehicular tunnels, as the requirements for Diesel engines may differ from those of gasoline engines. This paper does not include information based upon underground use.

Comparison of Operating Principles of Gasoline and Diesel Engines

Before proceeding with presentation of the details of this investigation it may be well to consider some of the basic differences in the operating principles of gasoline engines and Diesel engines:

In conventional gasoline engines, equipped with carburetor and spark-ignition, the fuel is atomized, vaporized, and mixed with air in the carburetor. The gasoline-air mixture is then drawn into the cylinders, compressed, and ignited by an electric spark. The power output of the engine is regulated by the quantity of this mixture admitted to the cylinders through a throttling device interposed between the carburetor and the cylinders.

In the Diesel, or compression-ignition engine, fuel and air are mixed directly in the cylinders. An essentially constant volume of air is drawn into the cylinders and compressed. Near the end of the compression stroke, fuel under high pressure is sprayed into the air, which, because it has been compressed, is at high enough temperature to cause spontaneous ignition of the fuel. The power output of Diesel engines is controlled by regulation of the quantity of fuel injected into the cylinders by a fuel pump capable of delivering varying quantities of fuel at high pressure.

It is evident that the ratio of fuel to air in the mixture supplied to the gasoline engine must be restricted to proportions that are within the inflammable or explosive limits of gasoline-air mixtures. The range of ratios of fuel to air within which a gasoline engine operates is therefore limited as compared to the fuel-air ratios obtained in Diesel engines, where air supply is essentially constant and fuel quantity is varied to meet power-output demand.

Furthermore, to obtain satisfactory

Table 1

Description of Engines Tested

Designation of engine	*A*	*B*
Type	4-stroke cycle	4-stroke cycle
Number of cylinders	4	4
Cylinder bore ..... inches	4¼	4
Piston stroke ..... inches	5½	4½
Piston displacement ..... cubic inches	312.1	226.2
Maximum rated speed ..... r.p.m.	1,400	2,600
Maximum rated brake horse power (without accessories)	44	70
Fuel pump	Individual pump for each cylinder; fuel delivery controlled by pump plunger by-pass	Individual pump for each cylinder; fuel delivery controlled by pump plunger by-pass
Type of injection valve	Single-hole orifice; flat-faced valve seat	Circumferential orifice (pintle nozzle); conical valve seat
Opening pressure of injection valve discharging into air at atmospheric pressure lb. per sq. in.	1,500	1,650
Combustion system	Cylindrical precombustion chamber with cone-shaped ends	Spherical turbulence or air-swirl chamber
Cooling system	Positive circulation, thermostatically controlled	Positive circulation, thermostatically controlled

performance with gasoline engines, the fuel-air ratio is adjusted so that there is too little air in the mixture for complete combustion of the fuel, thus producing considerable quantities of carbon monoxide. In contrast, Diesel engines can be operated at fuel-air ratios such that an excess of air is always present, and combustion proceeds much more nearly toward completeness.

TEST EQUIPMENT AND PROCEDURE

Engines and Dynamometer

Two standard, commercial Diesel engines have been tested. Each was mounted in a "power unit," including radiator, fan, clutch, fuel system, and starting mechanism. Each unit was coupled to an electric dynamometer to permit operation at various speeds and power outputs. The engines, designated "A" and "B," are described in Table 1.

The engines were adjusted in accordance with the recommendations of the manufacturers, except in the tests in which the adjustment of the fuel pump was altered to permit an increase in fuel injection. The report does not include data on the effect of such factors as excessive wear, improper atomization of fuel, or other maladjustments that might have significant effects on the composition of the exhaust gas.

Fuel

The chemical and physical properties of the fuel were as follows:

Flash point (P.M.C.C.) ..° F.	Above	200
Water and sediment.....	Trace	
Viscosity, S.U. at 100° F. sec.		48
Carbon residue	Trace	
Ash	do	
Gravity .....°A.P.I.		38.8
Pour point (upper).....° F.		50
Cetane number (knockmeter delay method)		78
Sulfur .....per cent	Trace	
Hydrogen ..... do		14.0
Carbon ..... do		86.0
Nitrogen ..... do		0
B.t.u. per lb.....		19,910

Test Procedure

The engines were new when received and were run for 100 hours at various speeds and loads before any tests were made. For each test the engine was operated for 1 hour at the desired speed and load conditions. During the last 15 minutes of this period samples of exhaust gas were collected, and a final measurement was made of fuel consumption.

Gas Sampling and Analysis

Constituents of Diesel exhaust gas that may create harmful or objectionable atmospheres are carbon monoxide, oxides of nitrogen, carbon dioxide, aldehydes, soot, and oxides of sulfur (if the fuel contains sulfur). The exhaust also contains water vapor, oxygen, and nitrogen; and under some conditions, hydrogen and methane; and trace amounts of other organic compounds.

Arrangements for collecting exhaust-gas samples are shown diagrammatically in Figure 1. Samples for determination of carbon dioxide, oxygen, carbon monoxide, methane, hydrogen, and nitrogen were collected from a metal tube inserted into the exhaust stack a short distance from the outlet of the manifold. A continuous stream of gas was drawn through this tube during sampling; a water seal was included in the sampling line as a precaution against contamination of the samples by air. An air-cooled condenser in this sampling line freed the gas stream of water that otherwise would have collected in the sample bottles. Samples for determination of carbon dioxide, oxygen, methane, hydrogen, and nitrogen were collected by mercury displacement. Samples for determination of carbon monoxide only were collected by water displacement. Samples for determination of aldehydes and oxides of nitrogen were collected (in evacuated bottles) through short lengths of glass tubing inserted into the exhaust stack through

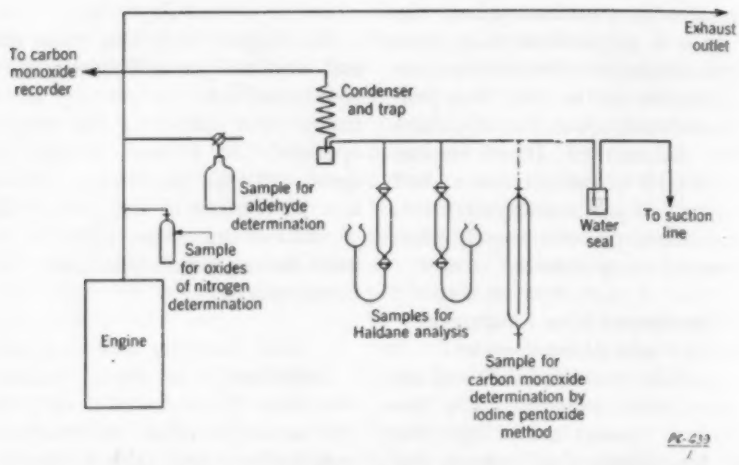

FIGURE 1—Diagrammatic sketch of arrangements for sampling exhaust gas

asbestos-packed stuffing boxes. The exhaust pipe of the engine was extended approximately 9 ft. beyond the sampling points before it terminated outdoors. This precaution is necessary in sampling the exhaust gases of an internal-combustion engine, as the pulsations in gas flow cause air to be drawn into the pipe between exhaust impulses for a considerable distance from the discharge end.

Carbon monoxide—Carbon monoxide was determined by the iodine pentoxide method when less than 0.5 per cent was present. If it exceeded this amount it was determined in a Bureau of Mines type laboratory Orsat apparatus by absorption in a mixture of cuprous sulfate, beta naphthol, and sulfuric acid.

Oxides of nitrogen—Oxides of nitrogen were determined by the phenoldisulfonic acid method.

Aldehydes—Aldehydes were determined colorimetrically with the Schiff-Elvove reagent, which produces color with practically all aldehydes, using formaldehyde as a standard.

Carbon dioxide, oxygen, methane, hydrogen, and nitrogen—These gases were determined in a Bureau of Mines type Haldane gas-analysis apparatus, except in certain samples in which the carbon monoxide content necessitated analysis in the Orsat apparatus.

RESULTS OF TESTS

The results of the tests are presented in the following tables and figures.

Table 2 shows representative data. The complete data have been published elsewhere [1] and are not presented here because of lack of space. The constituents of the exhaust that are of particular interest from the hygienic standpoint are carbon monoxide, oxides of nitrogen, carbon dioxide, oxygen, aldehydes, soot or smoke, and oxides of sulfur if the fuel contains significant amounts of sulfur.

Effect of Fuel-Air Ratio on Composition of Exhaust Gas

The effect of fuel-air ratio on exhaust gases from internal-combustion engines is extremely important from the standpoint of hygienic atmospheric conditions. Figure 2 shows the relationship of composition of exhaust gas to fuel-air ratios ranging from about 0.01 to 0.094 lb. of fuel per lb. of air. At a fuel-air ratio of 0.0679 there would be, theoretically, with the fuel used in these

TABLE 2

Representative test data and results—Engine B at approximately 1,400 r.p.m.

Test No. →	*B-13*	*B-14*	*B-15*	*B-16*	*B-12*	*B-70*	*B-72*	*B-69*
Net power output, b.h.p.	0 [1]	8.8	17.5	26.4	37.8	40.2	41.0	40.6
Fuel consumption, lb. per hr.	4.56	6.89	9.56	12.45	18.12	21.29	24.41	29.63
Volume of exhaust gas, cu. ft. per hr. [2]	4,500	4,460	4,180	4,050	3,950	3,700	3,650	4,050
Fuel-air ratio, lb. per lb.	0.013	0.020	0.029	0.039	0.056	0.070	0.084	0.094
Composition of exhaust gas, per cent by volume [3]								
CO_2	2.74	4.19	6.22	8.36	12.40	13.8	12.1	10.2
O_2	17.14	15.13	12.20	9.26	3.44	0.8	0.3	0.3
CO [4]	0.041	0.028	0.024	0.027	0.058	0.7	3.3	6.0
H_2	— [5]	—	—	—	—	0.1	1.3	3.0
CH_4	— [5]	—	—	—	0.03	0.1	0.3	0.4
N_2	80.08	80.65	81.56	82.35	84.07	84.5	82.7	80.1
Oxides of nitrogen, p.p.m. by volume [6]	167	267	378	448	364	346	277	186
Aldehydes, p.p.m., by volume [7]	4	1	1	1	4	1	2	0

[1] Minimum power output. Power output of engine consumed in mechanical losses and in driving accessories.

[2] Calculated as dry gas at 60° F. and 29.92 in. of mercury pressure.

[3] Calculated on a dry basis. Analyses in Bureau of Mines-type Haldane or Orsat apparatus.

[4] Values expressed to three decimal places were determined by the iodine pentoxide method; in calculating nitrogen by difference these values were expressed to nearest unit in second decimal place to conform with results of Haldane analysis. Carbon monoxide determined by combustion or absorption in tests B-70, B-72, and B-69.

[5] Dash indicates none detectable by analytical method used.

[6] As nitrogen peroxide, NO_2; not included in sum of percentages of other gases.

[7] As formaldehyde; not included in sum of percentages of other gases.

tests, just enough oxygen to burn completely all the fuel present, and this ratio is designated as the "chemically correct mixture." Thus, the fuel-air ratios studied included those in which air was present in considerable excess as well as those with insufficient air for complete combustion. The engines as received from the manufacturers were adjusted so that the maximum fuel-air ratio for engine A was 0.042 and for engine B 0.058 lb. per lb. The excess air present under these conditions was 61 and 17 per cent, respectively. It was necessary to change the manufacturer's adjustment of the fuel pump to obtain higher ratios at full throttle, and this was done with engine B. The maximum ratio studied was 0.094, and at this ratio only 70 per cent of the air required for complete combustion was present.

It will be observed from Figure 2 that, regardless of engine speed, the oxygen content of the exhaust decreased regularly to produce virtually a linear relationship up to a fuel-air ratio of 0.06. The carbon dioxide increased regularly and a similar linear relationship was produced up to about the same fuel-air ratio. These relationships illustrate the changes in the proportions of the reacting sub-

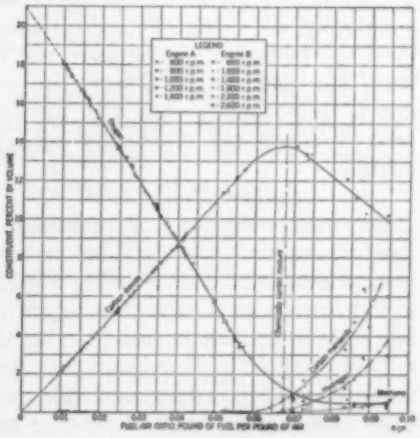

FIGURE 2—Relationship of composition of exhaust gas to fuel-air ratio

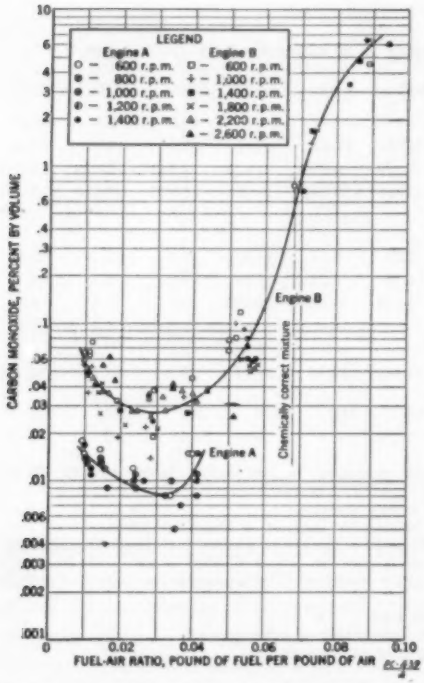

FIGURE 3—Relationship of carbon monoxide concentration in exhaust gas to fuel-air ratio

stances, fuel and air, as the power output of the engine, and consequently the fuel-air ratio, was increased. The concentration of carbon monoxide showed a marked increase as the fuel-air ratio approached the chemically correct mixture; and hydrogen and methane, which were not detected at lower fuel-air ratios, were found when the fuel-air ratio exceeded the chemically correct mixture.

Carbon Monoxide

For more complete and comprehensive presentation, the data for carbon monoxide have been replotted in Figure 3 with carbon monoxide on a logarithmic scale in relation to fuel-air ratio on a linear scale. It is evident that the concentration of carbon monoxide can vary over a wide range, depending on fuel-air ratio. Within the range of fuel-air ratios for which the engines were adjusted by their manufacturers the carbon monoxide content of the exhaust of engine A did not exceed 0.02 per cent and of engine B, 0.12 per cent. However, in tests with this adjustment altered, as the chemically correct mixture was approached from the lean side,* the concentration of carbon monoxide increased rapidly, and the effect was even greater when the chemically correct mixture was exceeded on the rich side * and concentrations of carbon monoxide comparable to those found in exhaust gases from gasoline engines were observed. Engine speed apparently had no pronounced effect on the concentration of carbon monoxide, although some slight variations that may be attributable to speed are noticeable in Figure 3.

If any advantages from the standpoint of carbon monoxide in the exhaust gas are to be gained from the use of the Diesel engine as compared to the gasoline engine, operation must be confined to fuel-air ratios less than the chemically correct mixture. Fortunately the characteristics of the Diesel engine are such that it can be operated near its maximum power output at such fuel-air ratios (see Figure 6). Thus, it is possible to control to a large extent the carbon monoxide hazard with proper engine adjustment without significant sacrifice of power output. Although carbon monoxide can be largely controlled in this manner the hazard should not be dismissed lightly nor should it be overlooked that ventilation is required.

Oxides of Nitrogen

The maximum concentration of oxides of nitrogen (expressed as equivalent nitrogen peroxide, NO_2) observed in the exhausts of engines A and B were respectively 440 and 676 p.p.m. of exhaust

* Fuel-air ratios less than the chemically correct mixture are referred to as being "on the lean side," and ratios greater than the chemically correct as being "on the rich side."

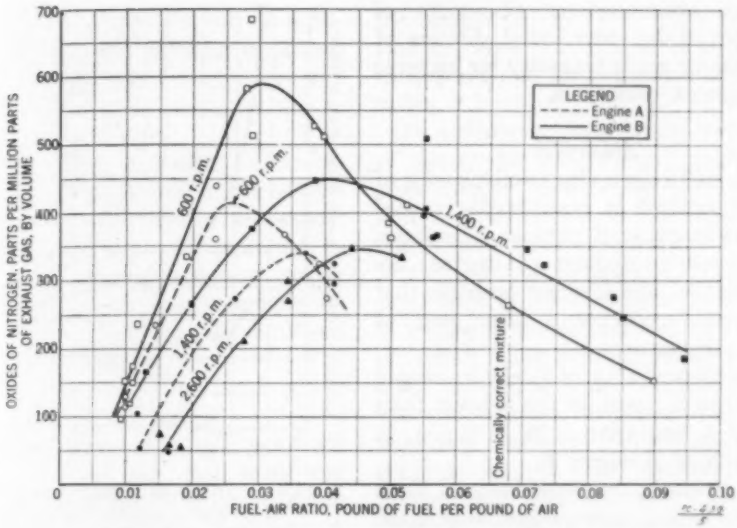

FIGURE 4—Relationship of concentration of oxides of nitrogen in exhaust gas to fuel-air ratio

gas, by volume, concentrations that obviously are of hygienic significance.

Figure 4 shows the relationship of concentration of oxides of nitrogen to fuel-air ratio. The concentration of oxides of nitrogen reached a maximum at intermediate fuel-air ratios. The maximum attained depended on engine design and speed, the value decreasing with increase in speed, with a tendency to shift to higher fuel-air ratios with increase in speed. The occurrence of a maximum in the concentration of oxides of nitrogen at intermediate fuel-air ratios may be attributable to a combination of the effects of the temperature of combustion and of the concentration of oxygen present during combustion. From the lowest fuel-air ratios to the intermediate values, the temperature of combustion increases, and predominates in the formation of oxides of nitrogen. From the intermediate to the higher fuel-air ratios, the diminishing concentration of oxygen would tend to inhibit their formation, and appears to be the predominating factor controlling their production in this range of fuel-air ratios.

Consideration of the possible effects of such factors on the production of oxides of nitrogen indicates that the concentration of these compounds in the exhaust might be expected to vary appreciably with different engines and operating conditions.

TABLE 3

Relationship between aldehyde content of exhaust gas and odor intensity and irritating effects

Aldehyde Content, Range of Concentrations, Parts per Million	*Odor Intensity*	*Irritating Effects*
0 to 10	Faint (weak odor, readily perceptible)	None to slight
10 to 50	Easily noticeable (moderate odor)	Slight (just perceptible)
50 to 100	Easily noticeable to strong odor	Moderate to strong (midway between just perceptible and discomforting)
100 and over	Very strong (intense effect)	Intolerable (exceedingly painful)

With concentrations of oxides of nitrogen of the order found, dilution of the exhaust gas is necessary for hygienic atmospheric conditions.

Aldehydes

The well known characteristic odor of Diesel exhaust is undoubtedly caused by partly oxidized organic substances, and possibly products of thermal decomposition, and it seems probable that aldehydes constitute a large part of these substances.

The concentration of aldehydes ranged from 0 to 5 p.p.m. in the exhaust from engine A and from 0 to 31 p.p.m. in the exhaust of engine B.

To ascertain the significance of these results, limited observations were made of the odor intensity and irritating effects of the exhaust when samples were taken for analysis. A correlation of these data is presented in Table 3. This table was prepared from 136 observations by 11 observers during some special experiments in which the range of aldehyde concentration was considerably broader than in the tests covered by this report. The response given under odor intensity or irritation represents the majority of observations for each particular range of concentration. As might be expected, there was considerable spread in the estimates of individuals. Nevertheless, there appears to be a correlation between odor and irritation of the exhaust gas and aldehyde content. However, it is emphasized that the number of observations and observers was limited and that other unidentified organic compounds may have been present and contributed to both odor and irritation. Although aldehydes in the concentrations found do not appear to present a health hazard when compared to the other toxic gases present, nevertheless they constitute a significant nuisance worthy of considerably more study.

Figure 5 shows the general trend in

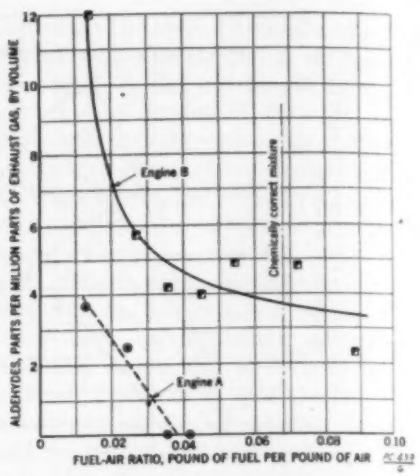

FIGURE 5—Trend of aldehyde concentration in exhaust gas with fuel-air ratio

the relationship of the aldehyde content of the exhaust gas to fuel-air ratio. The results indicate definite increase in concentration of aldehydes at the low fuel-air ratios.

Because of considerable variation in concentration of aldehyde in comparable tests, the discussion of the effect of engine speed on this constituent does not appear warranted. However, the data indicated the possibility that there was a tendency toward a decrease in aldehydes with increase in speed. As in the case of oxides of nitrogen, it appears probable also that engine design and operating conditions will have a marked effect on production of aldehydes.

Carbon Dioxide

The concentration of carbon dioxide in the exhaust from the two engines was between 2 and 13 per cent. Such concentrations may be expected from all Diesel engines, although the maximum and minimum concentrations for any given engine will depend on its adjustment. As an atmosphere containing more than 1 per cent carbon dioxide is not considered a satisfactory working environment, this gas must be consid-

ered in estimating the amount of ventilation required for safe use of Diesel engines underground.

Oxygen

The oxygen concentration in the exhaust gas is an indication of the oxygen consumed by combustion in the engine, and ventilation must be provided to replace the oxygen consumed so as to maintain an oxygen concentration greater than 19 per cent, the minimum considered permissible.

Oxides of Sulfur

Data on oxides of sulfur were not obtained because the fuel used was essentially sulfur-free. Obviously, if the fuel contains significant amounts of sulfur, it would be necessary to give consideration to the oxides of sulfur. Calculations indicate that a fuel containing 0.5 per cent sulfur would produce about 330 p.p.m. sulfur dioxide at the chemically correct fuel-air ratio. As this concentration, under certain conditions, might be the controlling factor in ventilation it is possible that the sulfur in the fuel should not exceed 0.2 to 0.3 per cent. More data are needed to establish this value definitely.

Smoke

The appearance of the exhaust was observed to obtain information on the tendency of the engines to produce smoke. When either engine was operated at its minimum load, particularly at low speed, a light blue haze was observed. This haze was present when either engine was idled, and was noticeably denser immediately after a cold engine was started. It was generally faint and could be distinguished only in reflected light. When either engine was operated under load, no haze was evident. In tests with engine B in which the adjustment of the fuel pump was altered to permit injection of additional fuel at full throttle, the appearance of the exhaust ranged from light gray at fuel-air ratios just greater than chemically correct to black at higher fuel-air ratios.

In addition to these visual estimates of smoke in the exhaust, qualitative tests always showed the presence of soot or free carbon in the exhaust of both engines, and calculations [2] applied to the test data indicated varying concentrations of free carbon in the exhaust of engine B throughout the wide range of fuel-air ratios (approximately 0.01 to 0.09) covered in tests with this engine. These calculations showed a definite relationship between fuel-air ratio and concentration of free carbon in the exhaust and also conformed with the visual estimates of smoke density, exhibiting a minimum at fuel-air ratios of from approximately 0.025 to 0.04, and a maximum at the highest ratio studied. Free carbon appears to be a normal constituent of Diesel exhaust throughout the entire operating range, although by far the most dense and objectionable smoke is produced by operation at fuel-air ratios where there is little or no excess air for combustion, and this is a condition that can be controlled by restricting operation to a proper range of fuel-air ratios.

Smoke production also may be caused by other conditions, including operation with the engine below proper temperature, faulty injection of fuel spray, excessive consumption of lubricating oil, and possibly use of low-grade fuel.

Relation of Power Output to Fuel-Air Ratio

Figure 6 shows the relationship of power output at constant speed to fuel-air ratio and illustrates a relationship characteristic of Diesel engines, in common with other types of internal-combustion engines, namely, that power output increases with fuel-air ratio until a maximum is reached on the rich side. Data illustrating this relationship were

obtained in tests of engine B at 1,400 r.p.m.; a similar relationship was observed in all tests covering a comparable range of fuel-air ratios. If the tests had been extended to include higher fuel-air ratios, the power output in this range would have decreased from the maximum shown in Figure 6.

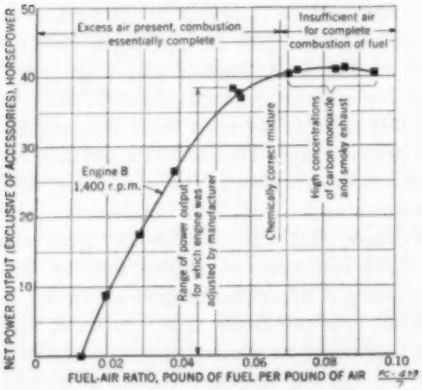

FIGURE 6—Relationship of power output to fuel-air ratio at 1,400 r.p.m. in tests with engine B

At constant speed and atmospheric conditions the weight of air drawn into a Diesel engine is approximately the same throughout the range of power output, and when combustion is essentially complete power output increases with the rate at which fuel is injected. Therefore, power output increases with fuel-air ratio in the range of essentially complete combustion.

In addition to the fact that the power output increased only slightly for fuel-air ratios above the chemically correct mixture it was noted also that this slight increase was obtained by a very large increase in fuel consumption. In other words, it is not economical to attempt to obtain an increased power output by operating at fuel-air ratios in excess of the chemically correct mixture. This point is emphasized because, as stated previously, it is necessary, in order to prevent large increases in the production of carbon monoxide, to regulate the fuel pump so that excessive fuel-air ratios cannot be attained. Such regulation of the fuel injection also tends to reduce excessive smoke formation, and it is significant that both carbon monoxide and smoke production can be largely controlled without materially affecting the power output of the engine.

Relation of Volume of Exhaust Gas to Engine Speed

The volume of exhaust gas produced is a necessary factor in calculating ventilation requirements. In this investigation the hourly production of exhaust gas was calculated from the rate of fuel consumption and from material balances between the constituents of the fuel and of the exhaust gas.[1] Figure 7 shows the volume of dry exhaust gas produced per hour by the engines in relation to speed. Two curves are included for each engine, one for minimum power output (accessories only), and the other for maximum rated power output. Piston displacement on the intake stroke is shown because the volume of air drawn into the engine is the principal factor in determining the volume of exhaust gases produced. The curves in Figure 7 show that at any given speed the volume of dry exhaust decreased slightly as the power output of the engine increased. Part of this decrease is a result of expressing the gas volume on a dry basis and not including the calculated volume of water vapor formed in combustion. In addition, part of the decrease may be due to changes in volumetric efficiency.

The piston displacement on the intake stroke shown in Figure 7 represents the maximum possible volume of air that can be taken into the engine. As the volume of dry exhaust gas is always less than the volume of air taken into the engine, in lieu of actual test data, the piston displacement on the intake stroke could be used as an

approximation of the volume of dry exhaust gas.

The volume of exhaust gas produced per unit time may be used as a basis for estimating the quantity of ventilating air required in locations such as mines or tunnels where adequate ventilation is imperative if Diesel engines are to be used safely. This estimate of ventilation is based upon dilution with air of the toxic constituents of the exhaust to concentrations considered permissible from the hygienic standpoint. The methods of calculation used in arriving at this estimate of ventilation have been described in detail in another publication.[1] It is emphasized, however, that such calculation produces a minimum value and is based upon the assumption that air of normal composition will be supplied for ventilation. In practical applications it appears that a margin of safety is desirable, and for this reason it is advisable to furnish an excess of ventilating air rather than to adhere to the minimum indicated by calculation. Further study of Diesel engines in the laboratory and under actual operating conditions should furnish a basis for deciding the magnitude of this margin of safety. It is possible that when more experience is gained, some empirical method may be found suitable for calculating ventilation required for any particular engine, but until such broad experience is gained, the calculation of basic ventilation requirements from tests of the type described appears to be the most rational approach to the problem.

DISCUSSION

As both laboratory results and practical experience have been limited, broad generalizations and final recommendations cannot be made; however, the information obtained to date indicates certain trends that should be of interest to the industrial hygienist. The statement is frequently seen that the amount of carbon monoxide in the exhaust of Diesel engines is negligible, with no mention of the other constituents. It is not believed that such statements are justifiable; and, even though no carbon monoxide were present, ventilation would be required to dilute the carbon dioxide produced and to maintain the oxygen content of the atmosphere above 19 per cent. The emphasis on carbon monoxide is probably due to the fact that it is associated with internal combustion engines, and from a theoretical standpoint it is probably the most significant constituent of Diesel exhaust gas owing to the fact that the amounts present may vary over an extremely wide range. However, the amounts present can be largely con-

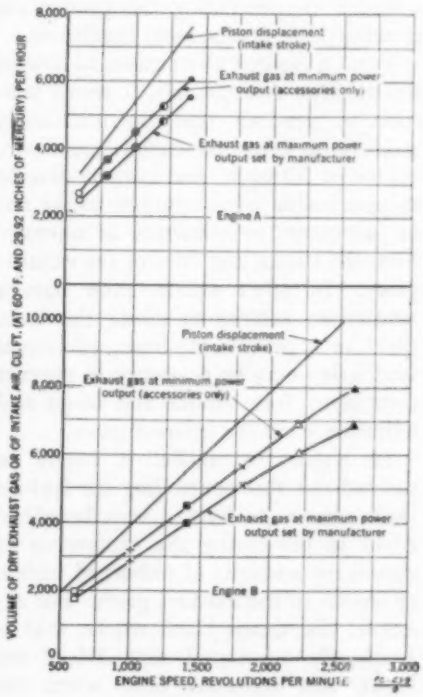

FIGURE 7—Relationship of volume of exhaust gas to engine speed at minimum and maximum power outputs

trolled, without significantly sacrificing power output, by operating in a suitable range of fuel-air ratios. Even under these conditions some carbon monoxide will be produced, and ventilation will be required for dilution. Provisions to prevent excessively high fuel-air ratios should be provided in the design of the engine as this is of extreme importance in the control of the carbon monoxide and smoke.

Oxides of nitrogen also occur in amounts that would be dangerous to health, and dilution of these gases is essential in preventing the production of unhygienic atmospheric conditions.

From a limited observation of Diesel locomotives underground, it seems possible to conclude that the ventilation required to dilute the carbon monoxide, oxides of nitrogen, and carbon dioxide to permissible concentrations might not be adequate to eliminate a nuisance from the smoke and odor of the exhaust gases. In other words, even though ventilation suffices to dilute the toxic gases to a permissible limit, additional ventilation may be necessary to prevent complaints from smoke and odors and irritation from the exhaust gases.

In regard to smoke, it might be pointed out that controlling the fuel-air ratio appears to have a very beneficial effect in preventing the occurrence of significant amounts of unburned carbon or smoke in the exhaust gases. For example, the dense black smoke that is frequently associated with Diesel exhaust was observed only when the engine was operated at fuel-air ratios exceeding the chemically correct mixture.

The fact that certain harmful and objectionable constituents of Diesel exhaust gas can be largely controlled by proper design of Diesel engines is interesting, in that it is in line with the recent trend of giving consideration to the industrial hygiene hazards associated with new developments.

SUMMARY

The composition of the exhaust gas of two commercial Diesel engines in proper mechanical condition was determined at different speeds and power outputs for fuel-air ratios ranging from approximately 0.01 to 0.09 lb. per lb. The constituents of the exhaust were carbon monoxide, oxides of nitrogen, carbon dioxide, aldehydes, soot, oxygen, nitrogen, water vapor, and under some conditions hydrogen and methane or other hydrocarbons. Oxides of sulfur would be present if the fuel contains sulfur. Carbon monoxide, carbon dioxide, and oxides of nitrogen were present in concentrations that are considered harmful to breathe. Under some conditions objectionable amounts of aldehydes and smoke may be produced.

The fuel-air ratio was found to have a marked effect on the production of carbon monoxide. When the engines were operated within the range for which they were rated and adjusted by the manufacturers, the maximum concentration of carbon monoxide in the exhaust from one engine was 0.02 per cent and in the other 0.12 per cent. However, by changing the adjustment limiting the quantity of fuel injected at full throttle so that fuel was injected in excess of that which could be burned completely by the air taken into the engine, the carbon monoxide was increased markedly, and concentrations of the order of those found in exhaust from gasoline engines were produced. Moreover, under these conditions, a large amount of smoke was produced. It is significant that the production of carbon monoxide and smoke can be largely controlled by the proper adjustment of the fuel-air ratio without a significant sacrifice of power output of the engine at full throttle.

Although experience is limited, the results indicate the importance of controlling the fuel-air ratio and also that Diesel engines should not be operated

underground unless ample ventilation is provided.

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Sulfonamide Therapy in Male Gonorrhea

A Comparative Study*

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THIS report covers the treatment of 519 unselected cases of male gonorrhea with seven different chemotherapeutic agents. Local therapy was used routinely with four of the seven drugs, not with the other three. The men were treated in the genitourinary section of the Washington University Clinics, St. Louis, between July 1, 1938, and July 1, 1940. The organization of the section has been reported in some detail in *Venereal Disease Information,* August, 1940. One item of note is the fact that, prior to the reorganization of the section two years ago, only 2.5 per cent of the patients remained under observation until cured. Since adequate laboratory, medical, and case control measures were instituted, only 10 per cent of the case load has been lost, 75 per cent dismissed as cured after satisfying rigid criteria of cure, and the remaining 15 per cent closed as unsatisfactory for study. This last category includes patients transferred to other treatment centers or who found it necessary to leave the city, those who attempted unauthorized self-medication, some who became reinfected while under treatment, and a few who for one reason or another had to be eliminated from the series.

This clinic serves as a teaching unit in the medical school and as one of several treatment centers in the municipal venereal disease program, coöperates with the U. S. Public Health Service in its clinical studies, and provides a demonstration unit for the State Board of Health of Missouri. It also provides means for the clinical evaluation of different chemotherapeutic agents.

Duplicate records are kept of each patient. One becomes a permanent part of his clinic record, the other is sent to the U. S. Public Health Service for statistical study. The record form used was devised by the American Neisserian Medical Society in coöperation with the U. S. Public Health Service.

Every effort has been made to systematize the treatment and control of patients. The routine of therapy has been modified from time to time, particularly with regard to provocative studies and the length of the period of observation. Minimum requirements are those recently set up by the Clinical Coöperative Group for Male Gonorrhea. These consist of 3 negative cultures, 1, 5, and 9 weeks after treatment has been stopped. Earlier requirements in this clinic called for various provocative procedures during a month of observation after the period of active treatment and 3 monthly check-ups thereafter,

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* From the Washington University Clinics, St. Louis, Mo., in coöperation with the State Board of Health of Missouri.

Read before the Southern Branch American Public Health Association at the Ninth Annual Meeting in Louisville, Ky., November 13, 1940.

TABLE 1

Final Disposition of All Cases

Drug	Per cent Cured	Closed without Proof of Cure: Per cent Lost	Per cent Unsat. for Study	Per cent Transferred	Per cent Reinfected	Per cent Left City	Per cent Oral Therapy Changed	No. of Cases
Sulfanilamide	64	15	9	5	1	1	5	95
Benzene-sulfone-dimethylamide	61	6	5	6	6	6	10	61
Sodium benzene-sulfone-dimethylamide	63	10	3	3	4	8	9	191
Sulfanilamide-magnesium oxide	66	8	4	6	0	4	12	50
Sulfapyridine	70	4	2	0	9	2	13	47
Sulfamethyl-thiazole	81	5	0	0	3	5	6	37
Sulfathiazole	71	5	3	0	15	3	3	38
Total								519

making altogether an average of 5½ months of treatment-observation. The latter criteria required a minimum of 6 negative cultures. Approximately 5,000 Gram stains and over 5,000 cultures were made on this group during the 2 year period. All cultures were made by Dr. Axel Gronau, Department of Bacteriology, Washington University.

Since a central statistical agency has not been available for the evaluation of drug therapy, we have devised our own method for comparing results. This consists of recording the weekly bacteriologic progress of each patient on special charts.* These charts show at a glance the general effectiveness of a particular sulfonamide drug on a group of patients. More important, however, is the fact that they make possible an accurate comparison of different routines of therapy by means of a weekly summary on each chart of positive and negative smears and cultures, lapses, changes in therapy, cures, etc. The charts are displayed prominently in the clinic so that all personnel is acquainted with end results as well as with the early progress of any drug on trial.

* Three progress charts to record the bacteriologic response of each patient during successive weeks of treatment and observation have been omitted from the text because reproduction was deemed impossible.

This report includes three groups of patients receiving different sulfonamide drugs which are now commercially available. One group of men received 2.6 gm. of sulfanilamide daily, combined with self-administered hand injections of protargol 0.25 per cent twice a day.

A second group was made up of 47 cases in which 2 gm. of sulfapyridine given daily for a period of 10 days was the only therapeutic agent. The rapidity with which this group became non-infectious was notable.

The third group illustrates the striking progress and end results of the first 38 cases treated with sulfathiazole alone, given at the rate of 4 gm. a day for 5 days.

Table 1 shows the final disposition of the entire group of 519 cases. Seven different chemotherapeutic agents are listed. Attention is directed to the column showing the instances in which oral therapy was changed or discontinued. Figures from 3 to 14 per cent are noted. These may be considered as drug failures. Responsibility for the decision to change or drop oral medication cannot be reduced to a routine. We have found no means of eliminating the responsibility of the clinician for this decision. This represents the chief point at which the personal equation is

permitted to enter in the routine as we maintain it.

Reinfections are recorded as such only when the patient admits re-exposure without prophylaxis before satisfying all tests of cure; otherwise, reappearance of the clinical and bacterial signs of infection is recorded as a relapse.

The "cured" percentages in this table are gratifying but not particularly significant from a comparative standpoint because individual observation may have been continued for a year. Most cases should have attained a cure in that time regardless of the type of therapy employed.

nausea. The side reactions from sulfapyridine were more noticeable but also not severe enough to interfere with the established routine. This may have been due to the fact that only 2 gm. a day were used. An important factor in the control of such a group is not to make the patient ill from the medicament in use. Directions for taking the drug were also simplified by a uniform daily dosage, another factor in the control of this type of patient.

It is also of interest that the total dosage of both sulfathiazole and sulfapyridine was considerably less than that of sulfanilamide. Uninterrupted medication was used with all three

TABLE 2

Comparison of Dosages, Toxicity and Therapy

Drug	*Average Daily Dosage (grams)*	*Average Total Dosage (grams)*	*Relative Toxicity*	*Rest Period between Courses*	*Associated Local Therapy*
Sulfanilamide	2.7	75	++++	no	yes
Benzene-sulfone-dimethylamide	2.7	28	+	yes	yes
Sodium benzene-sulfone-dimethylamide	2.7	21	+	yes	yes
Sulfanilamide-magnesium oxide	2.7	74	+++	no	yes
Sulfapyridine	2.0	21	+++	no	no
Sulfamethyl-thiazole	4.0	20	+	no	no
Sulfathiazole	4.0	20	+	no	no

Table 2 shows the average daily dosage of each drug in the series, the average total dosage, the relative toxicity of the drugs one to the other in the dosages employed, whether or not a rest period between courses of oral medication was used, and whether local therapy was used in conjunction with oral therapy.

It is significant that, although larger daily doses of sulfathiazole were used than of sulfapyridine or sulfanilamide, the side reactions were notably less. In a total of 200 cases treated with sulfathiazole there were no ill effects sufficient to withdraw the drug. Numerous patients complained of a transient

drugs, but the length of time the drug was given averaged 5 days for sulfathiazole, 10 days for sulfapyridine, and about 30 days for sulfanilamide.

That the good results obtained with both sulfapyridine and sulfathiazole were obtained without the use of local therapy is of most significance.

Table 3 shows the rate at which the seven groups of patients were rendered non-infectious. The percentage of negative smears and/or cultures obtained each week for 10 weeks is shown. It must be noted that perfect attendance each week for every patient was not realized so that the percentages shown assume that the bacteriologic response

TABLE 3

Probable Percentage of Negative Smears and/or Cultures by Weeks

(Based on perfect clinic attendance)

Drug	Cases	Weeks 1	2	3	4	5	6	7	8	9	10
Sulfanilamide	95	19	29	39	49	57	67	66	71	75	77
Benzene-sulfone-dimethylamide	61	35	46	60	64	72	73	76	80	72	78
Sodium benzene-sulfone-dimethylamide	191	36	52	63	71	73	77	81	84	83	83
Sulfanilamide-magnesium oxide	50	56	72	69	72	79	80	84	86	79	74
Sulfapyridine	47	77	87	91	97	97	94	97	97	90	97
Sulfamethyl-thiazole	37	94	97	93	93	93	94	93	93	93	93
Sulfathiazole	38	94	97	100	93	100	96	100	92	96	100
	519										

of lapsed patients in any one week would be the same as for those who were under observation that week. We believe this to be fair in that the lapse rate did not exceed 30 per cent in any group during the first 10 week period of observation. In other words, if half of a group of 90 patients who were seen in the second week of their disease were still infectious, it would seem fair to assume that half of the 10 remaining patients who were not seen in that week likewise remained infectious, making a total of 50 out of the total of 100 who were infectious in the second week. Likewise if, out of a group of 100 patients, 20 were not seen in the third week of their disease and 75 per cent of the remaining 80 were non-infectious, then it may reasonably be assumed that 75 per cent of the 20 lapsed patients were also non-infectious at that time. This would mean that 75 of the total 100, or 75 per cent, were rendered non-infectious at this time by the therapy employed.

The response to treatment after the first week is most significant. This ranges from 19 per cent negative smears and/or cultures in the "sulfanilamide plus local" group, to 94 per cent in the sulfathiazole treated group without local treatment. Rapid sterilization of gonococcal infections is of paramount importance if effective control of gonorrhea is to be attained. In this respect, sulfathiazole would appear to be more effective than sulfapyridine and both drugs far ahead of sulfanilamide. At the end of 10 weeks, however, the discrepancies in results are less noticeable. By this time the patient's own normal defense mechanism against the gonococcus is also a factor so that cure will be obtained in most patients as time goes on regardless of the type of therapy.

While only 38 cases treated with sulfathiazole are shown in this report, the behavior of this group is being paralleled closely by an additional 167 men who are in the process of study.

Thus, one may reasonably expect 4 men out of 20 to be cured at the end of 1 week when treated with a moderate daily dose of sulfanilamide combined with mild local therapy. Two grams of sulfapyridine daily for 10 days without any local treatment will cure 15 out of 20 men. On the other hand, 19 out of 20 men will be cured at the end of 1 week when the only therapy employed is the administration by mouth of 20 gm. of sulfathiazole over a 5 day period.

The results with sulfapyridine might have been better if the dosage for the

first few days had been larger than 2 gm. a day. We are not prepared to deny this, but we preferred to sacrifice a possible improvement in this respect to avoid a higher lapse rate from drug intolerance.

SUMMARY

A clinical evaluation of four experimental and three commercially available sulfonamide drugs in the treatment of 519 unselected cases of male gonorrhea has been made in a 2 year period at the Washington University Clinics. Coördination of an adequate laboratory service and an efficient case finding and case holding service with close medical supervision has been made possible by assistance with federal funds provided through the Missouri State Board of Health. This in turn has permitted an accurate clinical and bacteriological comparison of different drugs under carefully controlled conditions.

CONCLUSIONS

Sulfathiazole appears to be the most effective of the drugs at present commercially available for the treatment of male gonorrhea. The rapidity with which it renders a male patient noninfectious, together with the fact that it is well tolerated and relatively nontoxic, permits its use on a wide scale for the treatment and control of male gonorrhea.

NOTE: The benzene-sulfone-dimethylamide, sodium benzene-sulfone-dimethylamide, sulfanilamide-magnesium oxide, sulfamethylthiazole and sulfathiazole used in this study were supplied by the Department of Medical Research, Winthrop Chemical Company, New York, N. Y.

Contribution of Student Health Service to Adult Health Education*

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THOSE of us engaged in the medical supervision of college students are being stimulated to evaluate our contribution to adult health education because of the growing interest in this subject. It is the purpose of this paper to indicate how much the college physician may contribute to adult health education through his contacts with young people who are preparing themselves in college for the responsibilities of adult living. The college physician is employed primarily to keep students well enough to pursue their studies. Although his work usually includes the actual treatment of disease, his broader responsibilities to the college authorities are concerned with all possible methods of preventing disability in the student body. Every student forced to leave college because of disability represents a loss of investment not only to himself and his parents but to the college and to the state.

It is the college doctor's job to use every influence at his command to prevent such catastrophes. As a practising physician his work is unique, but also he is unique in that he is a member of a group engaged in the task of educating young men and women. Therefore he should recognize that he has an opportunity to contribute to this task by instructing in matters of personal and community health.

The young people in our colleges represent an important financial and social investment. Returns on this investment are poor if these people do not learn the principles of personal and community health that will enhance their value as voting and often leading members of their communities. Sally Lucas Jean [1] has stated this point clearly in connection with the value of school health work:

> Much has been written on all phases of the school health program and much progress has been made, but little emphasis has been placed upon the opportunity of the school to prepare the child to support public health measures when he becomes a voter.

If this is true of the child in school it is more true of the college student, since the state has invested more heavily in his education and because he is nearer the voting age and more directly concerned with the application of health education principles to adult life.

Because the college is trying to help these young men and women meet the challenge of community life after gradu-

* Read before the Health Education Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 8, 1940.

ation, it is important that in this educative process they learn to understand community health needs, that they have a basic knowledge to guide them in matters of personal health and that they learn something of the objectives and elements of preventive medicine. "It is well known that health knowledge far exceeds health practices, and to help bridge this gap is one of the privileges of education."[2] The real challenge of every college physician and hygiene teacher is the opportunity to help the student recognize the value of putting his health knowledge into practice.

Any evaluation of contributions that colleges are making to the field of adult health education raises two questions: (1) Are young people carrying away from our colleges something that will help them think and act intelligently as adults in matters of health? (2) What college experiences are contributing most to adult health education? Although a number of experiences within the college contribute indirectly to education in health matters, there are two experiences that operate most directly, namely, the contacts of the student in the hygiene classroom and his visits to the college physician's office. Both these experiences have fine possibilities to contribute to adult health education, but there is some question as to how much each is really contributing.

Every evidence points to the fact that less than one-half of the students now in college are receiving classroom instruction in hygiene or preventive medicine. In a recent study of college health programs made by the American Youth Commission[3] it was found that less than two-thirds of our American colleges and universities are offering courses in these subjects. This has been recently confirmed by one of us[4] who, as chairman of the committee on informational hygiene, made a canvass of 179 member institutions of the American Student Health Association and found that courses on health subjects were being offered in slightly more than a hundred of these colleges and universities. It is significant to learn from this report that the average extent of college credit in these courses was slightly over two semester units. In the equivalent of two hours for one semester it would be difficult to cover a field as broad as preventive medicine even on an elementary level. Courses are under the direction of medically trained people in less than one-third of the group.

This lack of health instruction in our colleges is due partly to a certain amount of stigmatization attached to the name "hygiene" in the minds of students. This is possibly a carry-over from lectures on sex, alcohol, and tobacco, delivered under that title in the lower schools. It is due also to the fact that in many colleges the courses in hygiene are being taught by faculty members not fully equipped to present modern concepts of health education.

Such courses would be benefited by more technical direction from the college physician. It might be profitable also to change the course title to "Elements of Preventive Medicine," as has been done in some universities (University of Minnesota). It is indeed unfortunate that these courses in elementary preventive medicine and public health are available to so few college students, since they are such valuable instruments in preparing young people to meet the health problems of adult life. We may be sure that the student's experience in the college hygiene classroom makes a distinct contribution to his preparation in health for later life, but all too few students are exposed to this experience and too many of the courses given lack dynamic material, effectiveness in teaching method and technical medical direction.

More students come into contact with the principles of preventive medicine

through the college physician than through classroom teaching during their college experience. Physicians are now employed in the majority of American colleges and universities. There is considerable variation in the amount of professional work being rendered, but medical service is fairly complete in over 300 institutions according to a recent study.[5] These colleges have recognized the value of providing the student with easily accessible facilities for medical care and advice to protect him against the disastrous results of disability, health neglect, and physical or emotional maladjustment.

Outpatient medical care is available in the so-called Student Health Services, and bed care is available in many institutions through student infirmaries or hospitals. The Student Health Service is not strictly an outpatient clinic or dispensary; neither is the infirmary usually a fully equipped hospital. Emphasis in the Student Health Service is placed upon general medical advice and the prevention and early treatment of illness. The infirmary is primarily equipped to provide bed care for students living away from home who develop illnesses that require only home care. The activities of both these services are therefore quite distinctive to the health problems of the young person in college. Although the physicians engaged in this type of work are concerned with the diagnosis and treatment of illness and injury, the chief emphasis of their work is that of prevention of disease and instruction in matters of health that will help the student to adjust himself to present environment and to health problems in life after graduation.

The work of the college physician offers opportunities for health instruction which have distinct advantages over classroom instruction. When a student comes to the physician for the care of an illness or for medical counsel he is in a peculiarly receptive mood. He has an immediate problem which is vital to him and for which he seeks an immediate solution. He desires knowledge and is ready to put that knowledge into action.

Instruction in the doctor's office has the further advantage of being individual in character; it takes into account the individual's background in matters of health, his particular needs, and the most appropriate educational method to meet these needs. The unique part of this individual educative process is that the student actually participates in the experience. "Our teaching is done by a combination of classroom method whereby the learner is at once the object of the demonstration and the beneficiary of the method. What could be more ideal?"[6] Education in other fields has used the laboratory to accomplish just this method. How much simpler would be the *classroom* teacher's job if students consulted him with the same motives of personal concern and the same receptiveness to instruction that exist when they consult the college physician.

Now let us see actually how the experiences of a student with his college health service may include health instruction that will contribute to his health education as an adult. His first contact with this service is for a periodic health examination required by most colleges of every entering student. This is probably his first complete health examination. He may come through the experience somewhat dazed, but he will soon become enlightened when he learns the purposes of the examination, the interpretation of its findings, the assurance that he is in good health, or the encouragement that will lead him to the correction of remediable defects. He may recognize the value of having these examinations repeated at regular intervals during and after his college career. If he plans to study for certain

professions he will be required to have these examinations repeated regularly while in college and will realize that this is the best possible guarantee of the special investment placed in his education.

Invaluable opportunities for health instruction arise in connection with the interpretation of these health examinations. The student often needs advice about his weight or help in balancing his diet. (Most students like others of us feel that they should be either heavier or lighter than the scales state.) He may need some instruction in the matter of selecting appropriate medical care for the correction of defects. He should gain some knowledge as to reasons for the various maneuvers of the physical examination. When tuberculin tests or radiological studies are included in these examinations, the student should receive valuable knowledge about tuberculosis. It is surprising to note the increasing interest of students in this disease since testing methods were introduced into our colleges. This is evidenced by the increasing number of students who ask to be given the test and by the number who come in to discuss various aspects of the disease. It is surprising also to note the increasing interest in the Wassermann test and in the whole subject of venereal disease since these tests were included routinely in the college health examination.

In this connection, we have been much interested in noting the increased number of student interviews in regard to marriage during the past year. This is due largely to the new state laws in California and Michigan which require a certificate of blood examination as part of the application for marriage license. When the student calls for this test or certificate he has a good opportunity to discuss the subject of venereal disease, and this conversation leads to other health matters associated with marriage.

Student interest in communicable diseases is aroused when immunizations are given at the time of the admission examination, and there is little doubt that these are valuable instructional devices. Furthermore, it is surprising to see how much information on the subject of communicable disease is gained by students at the time of an epidemic on the campus. They learn very shortly the presenting symptoms, possible methods of prevention, general precautionary measures to be taken, and the incubation and isolation periods. From our experience as college physicians we may safely say that the student group needs only a campus epidemic to improve their general knowledge of communicable disease and to recognize the part that they can take as members of a community to aid in its suppression.

After the health examination, the student's next contact with the health service is usually for the care of an injury or illness. If he can meet a doctor who is really interested in the educational opportunities of his work, the student will gain much information about his trouble and about other associated health matters during these visits. He will be encouraged to return again at the earliest sign of illness. This is good advice to the new student who often hesitates to call on the doctor for care of minor conditions. However, one illness which is allowed to develop to major proportions will teach him the value of going to the health service early enough next time so that his probable disability period may not be so disastrous to his study program. Actually, the new student learns much about these procedures of going to the doctor from older students who are able to tell him the value of early medical care gained from their own experience. Probably no other clinician sees so much disease in its subclinical form or in its incipiency. This procedure brings to the college physician many conditions

not serious enough to be seen by the doctor in private practice, but it also reduces the total amount of disability in the student body. This is borne out by the fact that deaths from appendicitis and pneumonia are extremely rare in colleges where health service is available, that tuberculosis is identified frequently in its subclinical stages (I refer here to recent studies of Dr. Stiehm in the Student Health Service at the University of Wisconsin [7]).

It is interesting to note that the average period of hospitalization is less than half as long for young people attending colleges where health service is provided as for those in colleges where no such service is available. Surely, the young man or woman who has learned the value of early and competent medical care while in college has passed important examinations in the subject of adult health education.

The authors are much interested in the number of letters received from former students indicating their desire to find physicians in their communities in whom they may place the confidence they had developed in the health service physicians. They are looking for someone who will use the same technics in practice, who will have time to discuss health matters with them, and who will refer them for bed care to an accredited hospital. Surely this is evidence of an ability to discriminate in favor of competent medical service and as such it is an important contribution of the college health service to adult health education.

Visits to the health service for the care of illness give the student an opportunity to become acquainted with the physician so that he will be ready to seek help from him in the solution of personal medical problems not associated with acute illness. Some of these problems arise from unsuccessful experimentation with such matters as sleep and diet and unbalanced schedules. Some arise from failure to adjust to physical handicaps or to psychological problems in the environment, while others are the result of post-adolescent struggles with health problems of sex, marriage, and future vocation. Many troubles are emotionally colored or appear on the surface as physical symptoms which actually mask mental maladjustments or even neuroses. It is important that such problems be attacked in their incipiency, not only to help the student make immediate adjustment, but also to reëducate him for the future. The college physician is interested in providing every facility for giving these problems the attention they deserve because they may be forerunners of more serious physical or mental trouble, because they may otherwise escape early attention, and because their solution may have important implications for future health practices. This form of medical counselling is indeed a vital contribution to adult health education.

During his four or more years in a college or university which has a Student Health Service fulfilling its educational opportunities, the student usually has had a number of experiences that contribute to his health education as an adult. He has had his first periodic health examination and frequently has begun the habit of seeking these examinations regularly. He has learned something about his health assets and liabilities which should help him balance his health budget regularly in future life. He has learned the value of correcting remediable handicaps and adjusting happily to handicaps that cannot be altered. He has learned that early medical care in the event of illness is the best protection against long periods of disability or health catastrophe. He has learned something about what the science of medicine can and cannot do for him, what he should expect of medical and hospital care, and how to discriminate between competent and

incompetent medical technics. He has learned to depend upon medical advice rather than the advice of his neighbors and friends for the solution of personal health problems. Indirectly he has gained some knowledge of how a community protects its citizens against communicable diseases, against water and food contamination, and against safety hazards.

But with all this favorable beginning he has only passed his intitial examination in adult health education. He may deserve a certificate of proficiency in the fundamentals of this subject at the time he receives his academic degree. His potentialities in the subject are good, but there is much yet to be learned, there are many practices learned in college that must be continued, and some new knowledge must be put into practice when he becomes a member of the community. That becomes the obligation of community health education. It is the sincere hope of the college physician that the adult health educator will find a receptive, interested, and informed student in the college graduate.

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Clinical Consultations and Hospital Care Services in a Maternal and Child Health Program*

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THE need for more and better medical care for people in the lower-middle income group has been recognized for years. The rich and the poor already benefit by modern medical science, but the low wage earner cannot pay for treatment which requires laboratory tests, x-rays, and hospital care. The Connecticut State Department of Health through its Bureau of Child Hygiene is taking an active part in attempting to solve the problem of medical care for obstetric and pediatric cases in families which are medically indigent by offering clinical consultations to family physicians in charge of such cases and by paying for hospital care wherever necessary.

Nearly three years ago, a service providing clinical consultation to family physicians for their obstetric cases was started through the united efforts of the State Medical Society and the State Department of Health. The purpose of this service was to make it possible for physicians to obtain skilled obstetrical consultation for abnormal or borderline cases who otherwise would not be able to secure this type of care. It has seemed that a service providing pediatric consultation, also a means of paying for necessary hospital care for both obstetric and pediatric cases occurring in medically indigent families, would be most worth while.

SOURCE AND USE OF FUNDS

In connection with the 1939–1940 Connecticut State Plan for Maternal and Child Health Services, a request was made to the U. S. Children's Bureau for funds to pay for clinical consultations and for hospital care of obstetric and pediatric cases referred by the clinical consultants. The funds available are insufficient to assume payment of consultation fees and the hospital bill of all cases occurring in medically indigent families in the state. It is felt that in cities with a population greater than 50,000, residents have better access to clinical facilities than do patients living in smaller communities. To be eligible for the consultation service, a patient must be a resident of a town having a population of less than 50,000 and must be self-supporting but unable to pay for medical care. Financial eligibility of each case is determined by the family physician who finds out, if he does not already know, whether the case is on town aid or is unable to pay medical expenses. Consultation fees are paid upon receipt of the appropriate form signed by the attending physician and the consultant. A fee of $5 is paid for

* Read before the Maternal and Child Health Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 10, 1940.

a consultation in the consultant's office, while a fee of $10 is paid for a consultation which requires the consultant to travel to the patient. A maximum of $20 for consultation fees is allowed for each case. Consultants are reimbursed for travel at the rate of 5 cents per mile. If transportation of the patient to the hospital requires an ambulance, the charge will be paid at a stated rate by the Bureau of Child Hygiene.

Hospital bills for the patients, who are placed on ward service, will be paid at previously arranged rates either on an all-inclusive per diem rate, or at a basic per diem rate plus extras. Consultants may authorize hospital care for the first 4 days, while approval of extension of hospitalization rests with the Director of the Bureau of Child Hygiene. Investigation of cases hospitalized may be necessary in certain instances. No patients except premature infants will be accepted for hospital care unless hospitalization has been recommended by an obstetrical or a pediatric consultant. It should be emphasized that except for premature infants, cases accepted for hospital care are those whose family physician has requested consultation and for whom the consultant has recommended hospitalization. In those instances where the consultant has been called by the family as its family physician, no consultation fee is available, but the consultant may authorize hospital care. Cases already in the hospital are not eligible for hospital care under Bureau of Child Hygiene funds.

APPOINTMENT OF CONSULTANTS

Consultants are appointed following their recommendation by the Public Health Committee of the State Medical Society. It has seemed expedient to require one classification of qualifications for physicians practising in urban centers and another for physicians practising in towns having a population of less than 50,000. Since May 1, 1940, the policy has been to appoint physicians who meet the following requirements:

PHYSICIAN REQUIREMENTS

Physicians practising in cities or groups of towns where the population is greater than 50,000 must be certified by the American Board of Obstetrics and Gynecology or certified by the American Board of Pediatrics.

Physicians practising in cities or groups of towns where the population is less than 50,000 must have had 1 year's rotating internship and at least 1 year's hospital training in obstetrics or pediatrics, plus 5 years' service on the obstetric or pediatric staff of the local general hospital; or consideration will be given to physicians who have taken a year of graduate work in their specialty, or who have been responsible for the obstetric or pediatric service of the local general hospital for 10 years or more, providing the record of that hospital is satisfactory.

HOW CONSULTING SERVICES FUNCTION

A physician in charge of an obstetrical or pediatric case, feeling that consultation is desirable, calls a consultant on the list received from the State Department of Health and asks him to see the case. The consultant makes an examination and gives his recommendation for treatment to the attending physician. Consultation may be had for obstetric patients at any time during pregnancy, at the time of delivery, or during the postpartum period. For pediatric patients, the attending physician may call a pediatric consultant for any infant or child under 16 years of age who is acutely or chronically ill and who presents a diagnostic or therapeutic problem.

PROVISION FOR HOSPITAL CARE

If treatment recommended by the consultant requires hospitalization, and the attending physician agrees, the patient is sent to the nearest approved hospital. The form signed by the consultant authorizing hospital care for the first 4 days should accompany the patient to the hospital. The patient is

placed on ward service. If the hospital stay is expected to be longer than 4 days, the superintendent requests extension of hospitalization on a form provided for that purpose. No consultation fees are paid for patients while on ward service, but provision is made for all necessary x-rays and laboratory tests.

HOSPITAL STANDARDS

Hospitals approved for care of obstetric or pediatric cases must meet definite standards. Since the State Department of Health licenses maternity hospitals according to minimum requirements in the *Sanitary Code*, it has been necessary to designate only a few additional requirements for maternity hospitals approved for care:

HOSPITAL REQUIREMENTS FOR OBSTETRIC CASES

They must have on their obstetrical staff a physician who has been appointed as an obstetrical consultant. The attending staff and obstetrical consultants shall make a thorough review and analysis of the obstetric work done in the hospital, at least monthly, with particular consideration to all deaths (maternal, neonatal, and stillborn) and morbidities and complications. Facilities must include x-ray equipment and trained personnel; an operating room equipped for performing major surgical operations; a laboratory for blood counts, hemoglobin determinations, typing and cross-matching of blood, for blood chemistry, for bacteriological examinations, and equipment necessary for giving blood transfusions; and ambulance service available throughout the area served by the hospital. Furthermore, it is recommended that the hospital require that a consultation be held with a specialist in obstetrics prior to any major obstetrical operation and for the treatment of serious complications of pregnancy.

Hospitals approved for the care of infants and children under 16 years of age (not including premature infants) are required to meet certain standards:

HOSPITAL STANDARDS FOR CHILDREN UNDER 16

The pediatric service shall be under the supervision of a staff including at least one physician who has been appointed as a pediatric consultant; the attending staff and pediatric consultants shall make a thorough review and analysis of the pediatric work done in the hospital, at least monthly, with particular consideration to causes of deaths and illnesses; a registered nurse shall be in attendance at all times; the building, equipment, and surroundings shall be kept clean at all times, and the management and operation of the hospital shall be such as reasonably to insure the health, comfort, and safety of the patients; the buildings, equipment, and precautions taken to provide for the safety of patients and employees in case of fire must meet the approval of the State Commissioner of Health; adequate facilities must be available for the isolation of children with evidence of infection; the equipment of the operating room shall be adequate for the performing of major surgical operations; adequate laboratory facilities must be available for blood counts, hemoglobin determinations, typing and cross-matching of blood, urinalyses, blood chemistry, bacteriological examinations, routine pathological examinations; adequate facilities for giving blood transfusions; facilities for supplying oxygen and apparatus for its continuous administration; x-ray equipment and trained personnel; accurate and complete medical records including history, physical examination, laboratory data, and records of treatment; ambulance service available throughout the territory served by the hospital. In addition it is recommended that pediatric patients be segregated from other patients.

In addition to meeting hospital standards for children under 16, hospitals caring for premature infants must have:

HOSPITAL STANDARDS FOR PREMATURE INFANTS

A separate nursery, or other facilities, providing segregation in a suitable environment for premature infants; a registered nurse and preferably one with special training in the care of premature infants in attendance at all times; no member of the nursing staff that cares for premature infants may attend other patients who may have infections or contagious diseases; one incubator for every 10 or less bassinets; a nursery equipped with means for maintaining a constant temperature of 75° to 80° F., and with some means for humidifying the room up to 55 or 65 per cent; hospitals accepting a premature infant born outside the hospital must provide a suitable nursery and isolation facilities on the pediatric service for its care, and the hos-

pital shall be provided with a portable incubator for use in transferring premature infants from the home to the hospital.

It is recommended that all hospitals refer the cases hospitalized under the Obstetrical or Pediatric Consulting Services to local public health nursing organizations so that the home may be prepared for the patient's arrival and so that there may be nursing supervision of the patient in the home.

SUMMARY

1. A program of clinical consultations in obstetrics and pediatrics and of hospital care services is being carried on by the Connecticut State Department of Health in coöperation with the Connecticut State Medical Society and the Connecticut State Hospital Association.

2. The services are limited to patients of borderline economic level, living in towns of less than 50,000 population.

3. Qualifications for consultants are specified.

4. The consultant is called directly by the attending physician.

5. The consultant is paid a nominal fee.

6. The financial eligibility of each case is determined by the family physician.

7. Hospital care may be recommended by the consultant.

8. Hospitals approved for care must meet certain requirements.

9. In certain instances it may be necessary to investigate cases hospitalized.

Objectives of Regular Child Health Supervision*

Are they being met by the average child health conference?

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INTENT though we may be on the present international situation, nothing would be more shortsighted than for us to neglect or retreat from a program of child health. In the long run, this program is itself related to the proper preparedness of our population of the future. I think I should remind you that the recent history of both the acceptance of public responsibility and the rapid expansion of child health activities are in many ways the direct outgrowth of the last war. Physical examinations of recruits and draftees then were so completely disillusioning concerning the health of our youth that in 1921 the Congress passed the Maternity and Infancy Act (the so-called Shepard-Towner Act). In many rural communities, child health conferences were thus established, school health work was stimulated, and people enjoyed for the first time the advantages of a publicly supported program for better care for infants and children. For a multiplicity of reasons which would not be within the scope of this paper, the provisions of the Act were not extended, but much constructive work had been accomplished and it was just a question of time until in 1935 the Social Security Act became a law of this land.

Now we are confronted with another conflict. It now seems time to build tanks and cannons instead of healthy minds and bodies. During such times there are usually no signs of retrenchment as far as provisions for child and maternal health activities are concerned, but there is also little opportunity for expansion. Yet we, as educators, have as a duty to our country to provide training for surgical technicians in the field of traumatic surgery and to provide training for better care for infants and mothers. It is too soon after our White House Conference on Children in a Democracy to start talking solely of children in a martial state. Let us hope that the same factors which caused our tremendous spurt as the result of the last war are now operating. Let us be ready for them again and avoid the pitfalls of the Shepard-Towner days. It is, therefore, a time for analysis and redefinition of objectives—a time to re-evaluate in the hope that when expansion comes we will know our problem, our deficiencies, and thereby be that much closer to the goal.

* Read before the Maternal and Child Health Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 10, 1940.

OBJECTIVES OF THE CHILD HEALTH CONFERENCE

The child health conference should serve as an educational center for the physician. As conditions permit he should use it to acquaint himself with the application of certain teaching technics, such as the details of habit formation and procedures for prophylaxis of communicable diseases. The physician should evaluate the modern teaching of preventive pediatrics and thus carry to his own patients methods for improving health by preventive means. This objective if accomplished makes the physician an integral part of the program. It will counteract a mistake of Shepard-Towner days.

The conference also provides an educational experience for the nurse, which in turn prepares her to do a better teaching job. It gives her an opportunity to evaluate her teaching methods. The correlation in the conference of various elements of her work such as nutrition, mental hygiene, and dental health, should be among her aims.

Finally, the child health conference should be a place where parental education is done by physicians rather than by lay magazines or by poorly informed relatives and neighbors. The resort to magazines and pseudoscientific programs is at least in part due to neglect by the medical profession properly to educate itself and the people in sound principles of nutrition and prevention of disease. It is here then in the child health conference that the individual child is appraised and deviations from normal growth and behavior are noted. The parents should be informed of any such deviations, and corrective measures should be instituted by the family physician. Parents should be given an opportunity to gain a better understanding of the minimum physical and mental requirements of a growing child and of methods for coping with changes that occur as the child grows older. This objective, if accomplished, is the giving of service. Too much emphasis however is frequently placed on this point and not enough on the educational objectives mentioned above.

These then are the objectives, clearly stated, and to which all of you will subscribe. Are they being met by the average child health conference today? The answer is an emphatic "no!" But should we be discouraged because we cannot meet them except in isolated areas and cases? This answer is likewise an emphatic "no!" What we need more than anything else is the patience, factual knowledge, and ability to work harder in order to get these objectives over to the ones who have been carrying and always will carry the ball—the practising physicians who conduct the conferences. To do this, I will discuss under several headings the problem of getting these objectives over to the practitioner.

PERSONNEL

Those of us intimately engaged in the teaching and practice of pediatrics and child health service are definitely of the opinion that special training is necessary in order to perfect oneself in the technics of health instruction and methods of the child health examination. This does not mean that the work can be done only by members of the American Board of Pediatrics. Two and seven-tenths per cent of board members practise in rural areas, yet many more babies are born in rural than in urban areas. We could not begin to train a sufficient number of pediatricians to do the work on even a part-time basis. It therefore seems an entirely sound principle, particularly in view of the possibility that with expansion the general practitioner will eventually be involved in the problem of medical care of the needy sick, to train this practitioner to do the work. He should be prepared to make some extra effort in

this regard by familiarizing himself with a number of standard publications on infant and child care and the examination of the child. The urologist and the nose and throat specialists have their special technics. The health examination is our special technic and it takes special training in order to do a good job.

How, then, may the general practitioner acquire these technics? Two methods seem useful—postgraduate refresher courses in clinical pediatrics, and the adequate utilization of the specialist.

POSTGRADUATE EDUCATION

The medical education in the United States is an excellent one, but is not without growing pains. As medical specialization has grown, medical practice has become more complex and the basic requirements for becoming a good physician have been steadily broadened. It has been shown that unless a physician makes some special effort to take postgraduate training within 5 years after going into practice, he will probably never make the attempt.

For various reasons postgraduate medical education in the past has been most ineffective. Up to very recently it was impossible for a western physician to obtain courses in the technics of child health supervision west of St. Louis. The cost of setting up a postgraduate course in clinical medicine at medical centers is often great. The expense to the physician student of remaining away from his practice for a sufficient period is another factor. The lack of understanding by the academician of the problem which confronts the general practitioner often makes the teaching ineffective. Finally, there has been lethargy on the part of the medical profession in the recognition of the needs and benefits of adequate postgraduate medical education. Certainly state university medical schools are not fulfilling their complete function if they do not make the facts developed at medical centers available to all physicians. Medical education like other forms of adult education cannot be delivered in large massive doses and then discontinued. It must be a continuous thing; it is "lifelong learning."

And so in the improvement of child health service, considerable thought and energy must be put into postgraduate medical education. This must be along lines of developing centers easily accessible to the practitioner. I do not mean the traveling 2 or 3 day clinics, but intensive 2 to 4 week courses in technics of child health examination. Such instruction can only be tolerated in wisely administered doses. Consequently, it should be a continuous process and it should be followed by a "circuit rider" type of extramural postgraduate course which is done with the county medical society or in consultation service with the physician in his own office.

UTILIZATION OF THE CHILD SPECIALIST

Public officials in the health field have about arrived at the realization that if the quality of child health services is to be maintained at a high level, there must be continuous supervision. This cannot be done solely by the administrator and surely not by the "arm chair" director. The services, on a full- or part-time basis, of the specialist to carry out this supervision must be employed. This is true not only because the future may see expansion into the field of medical care for the needy sick but also because the child health program is essentially a clinical one. The general practitioner bears and will continue to bear the brunt in the clinical program, but he needs the help and continuous supervision of the child specialist. Let the pediatricians and public health personnel guide the physician and lay people in these efforts. Many state departments have already added

to their staffs such a consultant or adviser on a full- or part-time basis. Obviously for the county unit this will not always be practical but here again the county health officer will find himself more and more in the clinical field of medical care. I believe the days of the "arm chair" health officer are numbered. Beside his administrative duties he must also acquaint himself with the facts and technics of child health supervision. He must also have access to postgraduate courses where he may refresh himself in these technics. I believe that the training of health officers for rural areas should be directed more along clinical lines. An experience in both intramural postgraduate work and in "circuit riding" has convinced me of the necessity of clinical training in pediatrics if we expect more than lip service to the child health program from many appointees in public health offices. The promotion of a program is best accomplished by a health officer who by reason of his knowledge of clinical medicine can be of positive assistance to the practitioner in his clinical problems. He is then ready to assume a more militant rôle with the practising physician in his supervisory capacity of attaining the objectives of child health supervision.

CONTENT OF THE PROGRAM

A. *Eligibility for the Child Health Conference*—It is my opinion that in rural areas there should be no economic regulations regarding attendance at well child conferences. Any such regulation will inevitably destroy the purpose of the conference by stigmatizing certain groups. The underprivileged will not attend the conference if thus stigmatized, and it is this group which can gain the greatest benefits from it. In many communities parents who can afford to pay for well baby service have not yet learned to appreciate this preventive service and therefore will not pay for it. Since it is primarily educational in its scope, I believe every parent, regardless of economic status, who has a well child below the age of 6 years, should be eligible. The only exceptions should be parents whose children already are receiving routine health supervision by their private physician, unless this physician requests consultation service at the conference. If it is known to all physicians that the conference is educational and preventive in nature, there is no reason why they should object to another physician examining their patients during the course of the conference. When the private physician realizes that any defect found in such a health examination will be referred to him for correction he will usually welcome the consultation service. Furthermore, there is an actual increase in pediatric practice in many localities after the education of parents has demonstrated the value of the health supervision program. The health supervision of a child should, of course, have continuity, and it is important that the information in the possession of the private physician and the conference be available to both, when both are interested in a child.

It might be well to recall that in these times of economic stress there are many parents whose health budget allows for calling a physician only when a child is sick. The only preventive service available to them is that provided by child health conferences. This service to parents carried out in the child health conference is an important link in our whole preventive medical program. It is obvious that police protection, fire protection, parks, and school systems are not limited to any one group. Preventive medicine, because it is community-wide, therefore cannot be limited to the medically needy if it is to achieve its goal. This is particularly true in rural United States.

Eligibility for attendance at the child health conference might have to be established on the basis of the general philosophy of the community where it is conducted. The pressure of public opinion and the viewpoint of organized leadership, such as the medical societies and lay groups interested in child welfare, must be considered. It is of the greatest importance that the sanction of the medical society should be obtained on this point.

It is not sufficient merely to establish child health conferences and provide personnel for them. Administering authorities should recognize a fundamental principle underlying this service, which is the establishment and preservation of the personal relationship between physician, child, and parent.

I therefore strongly advise that the child health conference in rural areas where the medical service is limited should be open to all regardless of socio-economic rating, and I speak not only as an academic person but as one who has actually sold this idea to the profession.

B. *Services Available at the Conference*—Although the services to be rendered at the child health conference are preventive and have to do mainly with maternal education, the program must include formula regulation; solid food additions; the accessory food substances must be prescribed; immunizations at least against diphtheria and smallpox must be carried out; and habit training emphasized. Habit training is usually omitted in the average child health conference and it is particularly important for the preschool child.

C. *Number of Children Attending*—The attendance at any conference is dependent to a large degree on the effectiveness of the nurse's contacts with the parents. Too much emphasis, however, should not be placed on quantity in evaluating the work of the nurse; quality is of more importance and this cannot be obtained when the conference is too large. An appointment system works well in the child health conference, and the nurse is responsible for seeing that it runs smoothly. Each conference should be planned so that there will be no unnecessary duplication. The appointment system limits the attendance to the number that can be given satisfactory service, and it insures that in a limited time each mother shall get her allotted period.

Too many appointments should be avoided. The physician will fulfil his part of the educational work better if he does not have too many children to examine and if the session is not too long. The speaker believes that 2 hours should be the maximum period for the physician doing child health conference work, and that an average period of at least 6 minutes should be allowed for each examination—including recording and the talk with the parent.

The frequency of attendance is a matter entirely dependent on local conditions. A standard often set is that every well baby should be seen each month until he is 9 months of age and every 3 months thereafter until 2 years of age. From 2 to 6 years of age it is usually considered sufficient for well children to have examinations every 6 months.

In certain communities it will be impossible for mothers to bring small infants to conferences without also bringing two or even three preschool children, and some conferences meet this situation by admitting both infants and preschool children. It is desirable that 60 to 70 per cent of the attendance in this type of conference should be infants and preschool children under 2 years of age.

Occasionally the attendance will take a sharp drop. If this should happen for three consecutive conferences, a study of the situation may reveal an

obvious reason—inclement weather, for example. Again, the reason may lie in the personnel. While it is true that a great deal of the success of any conference depends on the nurse, all the responsibility is not hers. A disinterested or poorly informed physician may be the one who antagonizes the mothers and who is not giving them what they want and need, in spite of a capable nurse. Before discontinuing poorly attended conferences, changes in the conducting personnel might be considered.

D. *Services to the Physician* — The nurse is responsible for the smooth running of the conference, for making appointments for return visits, and for acquainting the conducting physician with the social and medical facts she has learned in her home visit or during previous contacts with the mother.

An excellent method of informing the physician about pertinent facts is to record these on the infant's chart. Such remarks as "child wetting bed," "cannot afford sufficient milk," or "child refuses cod liver oil," for example, will give him an insight into the psychological or social situation and a lead for him to follow up in regard to habit formation, which would be unobtainable otherwise.

If immunizations are performed at the conference, the nurse will assume responsibility for obtaining permission from parents. She will prepare needed materials, prepare the areas for inoculation, and keep records. Any skin rash or upper respiratory infection or a rectal temperature above 100° F. is a contraindication for any immunization procedure. Complicating rashes or reactions may endanger the entire immunization program.

The assisting nurse will see that the child enters the examining room undressed. Children under 2 years of age should be completely undressed. Panties or bloomers may be left on for the older children. The nurse will also assist the physician in securing the coöperation of the child. This will facilitate a better examination.

The time of the conference will depend on the convenience of the conducting doctor and the hour that local mothers can attend. If the physician is paid for his time he will be more apt to be regular and prompt.

Occasionally a medical emergency will arise, in which case the physician should secure another physician to take his place. Plans for an alternate whom the nurse can call in case of illness or other unavoidable circumstances is a satisfactory arrangement.

SUMMARY AND CONCLUSIONS

The greatest need for the establishment of child health supervision is in rural communities. Studies have shown that only 37 per cent of preschool children in these areas have had even a single health examination. At least 51 per cent of urban children have had this advantage.

Much has been accomplished since 1935 to meet this need. State departments of health established 522 new permanent child health conferences in 1939, making a total of 2,394 centers in 41 states where conferences were conducted by physicians at least once a month.

However, we have fallen far short of meeting the true objectives of child health supervision. Maternal and child health directors and county health officers have an abundant supply of written material outlining these objectives, but the pediatrician, the health educator, and the public health nurse must work harder to teach the general practitioner how to put them into effect. Postgraduate education and the utilization of the specialist have been suggested as the best immediate means of accomplishing this.

Some points concerning personnel, clinical management, eligibility and con-

tent of the program for child health supervision have been discussed. In conclusion I think it is about time we were finding out what the parents, who are the recipients of all this service, are thinking about our efforts. It may very well be that they could help us in our reëvaluation and redefinition of the service. They may have some answers to our problems.

Atlantic City, N. J., Skyline

An Assessment of the Nutrition of a Rural Population in Tennessee*

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THE assessment of the nutrition of populations is a public health procedure. The primary object is not a study of the intimate nature of nutrition or the mechanism of disease due to nutritional deficiency. Neither is it concerned with sporadic cases of nutritional disease. Such cases are problems for the individual practising physician. Instead, studies of the nutrition of populations deal primarily with the incidence of deficiency disease, with its epidemiology, with "modes of transmission" which may be the effects of habit and custom, with etiology in so far as the cause is common to large groups of the population, and finally with problems of prevention.

An assessment of nutrition is to be distinguished from a survey of nutrition of which it may be a part. A complete survey of nutrition includes both a study of food consumption and an assessment of the physical state of the population. Both the study of food consumption and the assessment of nutrition can be accomplished in a variety of ways depending on the object in view and the facilities which are available. Thus the food consumption of a population may be determined merely from records of production and of imports and exports, and the nutritional state of the people estimated from a report of deaths due to malnutrition. Or, a small group may be studied in great detail with regard to both food consumption and the physiology of their nutrition.

For public health purposes a complete survey is very desirable. Until the present time the greater emphasis has usually been placed on the dietary study. This has been used not only to find out what and how much people ate but, by inference, the nature and frequency of disease due to dietary deficiency. In other words, the dietary survey has been used to assess the state of nutrition of the subjects. Such studies have yielded very valuable information. However, the method is indirect and inadequate for measuring the state of nutrition according to present-day standards. The reason for this use of the dietary study was the lack of satisfactory methods of examination for assessing the physical state. For the most part, these were the detection of the symptoms and physical signs of gross deficiency disease and such relatively crude measures of nutrition as the body weight, height, and similar anthropometric measurements. While such methods may have been sufficient at an earlier stage of our knowledge of

* Studies referred to herein are being conducted under the auspices of the International Health Division of the Rockefeller Foundation, New York, N. Y. Read before the Food and Nutrition Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 8, 1940.

nutrition, with the increasing recognition of the importance of subclinical or minimal deficiency states they were no longer adequate and a better procedure for assessing the nutritional state of a population was required. Such procedure should make possible an objective measurement of the nutrition of individual subjects with respect to individual factors of nutrition, in line with modern concepts of nutrition and nutritional deficiencies and with particular reference to mild or subclinical deficiency states.

While such methods of examination would be expected to give an objective measure of nutrition, independent of a record of dietary consumption and without certain drawbacks and errors of the latter procedure, it is not to be expected that food consumption is to be neglected. Dietary surveys are an important factor in determining the etiology and epidemiology, as well as certain social and economic aspects of nutritional deficiency, and for many public health purposes the complete nutrition survey, including both a study of food consumption and an assessment of nutrition will be required. The extent and type of the two studies will be determined by the purpose of the survey and the facilities available for it.

Within recent years much progress has been made in the development of suitable methods and tests for assessing nutrition and it seemed to us the tests now available would permit the assessment of the nutrition of a population as a public health procedure in terms of our present-day concept of nutrition and nutritional deficiency. We therefore began such a study with the dual purpose of developing a method suitable for public health purposes and demonstrating its effectiveness. For the reasons just given, the study is a complete nutrition survey including both a study of food consumption and a measure of the nutritional status of a population.

EXPERIMENTAL PROCEDURE

An area in middle Tennessee, predominantly rural and containing some 2,500 subjects, of whom about one-fourth are colored, was selected. Although variations exist within it, economically and socially it is considered to represent the average of the region. Statistically the study is made on a "universe" basis, that is, with the intention of examining every inhabitant in the area, although the study could be made on a basis of sampling, as well.

The record of food consumption is obtained by competent field workers on a family and individual basis using a week's inventory record for the family and three separate day periods of that week for each individual's consumption. Pertinent social and economic data are secured with the record of the diet.

The assessment of the physical condition of the subjects is made by a full medical history, a complete physical examination with particular respect to the signs of deficiency disease, and certain laboratory tests designed to detect not only frank cases of deficiency but the subclinical or latent forms as well.

The medical history and the physical examination are obtained and made by experienced physicians who have had special training in the diseases of nutrition in both children and adults. Certain simple anthropometric measurements are included. The examinations are made either in the home, in specially equipped quarters in the schools of the area, or at the Vanderbilt University Hospital.

LABORATORY TESTS

The laboratory tests include (a) a test of visual adaptation to dark using Hecht's adaptometer, (b) the concentration of vitamin C, and that of inorganic phosphorus, calcium, and phosphatase in the blood, (c) the total serum protein, serum albumin and globulin, and (d) the red cell count,

hemoglobin and hematocrit determination. In addition, vitamin B_1 excretion in the urine, the concentration of vitamin A in the blood, a bacteriologic test of free nicotinic acid in the blood, a measure of prothrombin concentration as an index of vitamin K deficiency, and a slit lamp examination for evidence of riboflavin deficiency have been done on a large number of the subjects.

An anterior-posterior x-ray of the wrist and a lateral of the ankle are made at constant distance and milliampere seconds with voltage varied according to the thickness of the parts. A graduated aluminum wedge is included in the film, and the density of bone measured with a photoelectric cell densitometer against a constant source of illumination. The usual clinical interpretation of the roentgenogram is made also.

It will be seen that these tests measure nutrition with specific respect to vitamins A, B, C, D, and K, nicotinic acid and riboflavin, protein, and iron as far as it is reflected by the red cell count and hemoglobin concentration. Calories are measured by a record of the diet and general nutrition, growth and development by physical measurements and the x-ray examination.

For the blood tests 30 ml. samples of blood are drawn under suitable conditions and properly preserved. All laboratory tests, the x-rays, and adaptometer tests are made at the Vanderbilt University Hospital. A complete study is made of each subject twice during the year, in a summer-fall and winter-spring period, presumably periods of optimum and minimum nutrition respectively.

It is realized that some of the tests may be unnecessary or non-informative and that the reliability or suitability of others may be in doubt. Time will not permit a discussion of the reasons for the selection of each of the tests or the details of the methods and standards. It was felt that in initiating a study of this kind certain tests which have been used or suggested in the past should be included for the purpose of determining their value and usefulness while newer tests of promise should be given a trial. Also it is believed that certain data, while not susceptible of final interpretation at the present time, will in the near future be significant even though the methods and tests by which such data are obtained are altered before reaching their final form.

In such a study as this it is not sufficient simply to apply the procedures which have been selected to the examination of the subjects. Well established tests and procedures may need to be modified to adapt them to the particular conditions under which they are to be used, and the suitability of such modifications must be determined. Certain otherwise satisfactory tests have had normal values established only for certain groups of subjects, such as children, and need additional data to extend those normal values to other groups of the population. Still other tests, although they give every evidence of being valid and reliable have not had a use extensive enough to warrant final judgment and must be given further trial under carefully controlled conditions. Therefore, a series of parallel studies are being carried on to check further the reliability and suitability of the procedures which are being used and to develop new and improved methods. Finally, it is planned to check the results of the study, as far as possible by repeating the examination in certain selected groups and with proper controls after the administration of supplements of the various food factors.

RESULTS OF THE STUDY

To date, some 900 subjects have been examined, about 500 of them for the second time. The study is still in progress and only a preliminary analysis

of some of the data has been made. No final results or conclusions can be presented at this time. However, some provisional findings are of interest and may suggest at least some trends which the survey seems to disclose. For the most part the findings which I shall discuss are based on laboratory tests alone, unsupported by correlation with the dietary record or the physical examination, and are highly provisional.

UNDERNUTRITION

An unexpected finding is an apparently high incidence of a deficiency of calories or *under*nutrition. According to the standards which have been temporarily adopted, such a deficiency has been found in as high as 100 per cent of certain age groups though the groups are not large enough to make exact percentages significant. The standards are those of the "Table of Minimum Quantities of Specified Nutrients to Be Furnished by Grade A Diets of the American Classification," U. S. Department of Agriculture, Bureau of Home Economics. The data so far available are derived from the individual records and have not been compared with the family record nor adjusted to calculated individual requirements. It is, therefore, probable this deficiency is less frequent than it appears. Nevertheless, it appears that a high incidence of caloric deficiency will be found, and this preliminary indication is supported by the fact that there appears to be a much greater tendency to underweight than overweight in our subjects.

Cases of protein deficiency have been entirely confined to adults and older children and so far none under 3 have shown lowered serum proteins. Among the former, however, a rather large number, about 20 per cent, have shown a hypoproteinemia.

Anemia believed to reflect iron deficiency has been found almost entirely in children and women. This supports the belief that iron intake is important only as a replacement for unusual blood losses and for requirements of growth, and that even a very poor diet will provide adequate iron for hemoglobin in the adult if there is no more than a normal loss of blood.

VITAMIN DEFICIENCIES

A high incidence of vitamin A deficiency, over 50 per cent, is indicated by the results of the visual test. In a considerable number of cases, however, the test readings fall in a somewhat questionable zone, and the results of certain additional studies suggest that other factors, such as age, may have influenced the results. Nevertheless, a sufficient number are so definitely abnormal that a considerable amount of vitamin A deficiency is indicated.

An incidence of vitamin C deficiency of about 20 per cent agrees fairly well with that found in other parts of this country in comparable studies. Distinct seasonal variations have been found with a definitely higher incidence in the winter-spring period. It is interesting that vitamin C deficiency is much more frequent in infants and adults than in children 3 to 15.

So far the evidence indicates a low incidence of vitamin B_1 deficiency, even of slight degree, a finding which agrees with general clinical observations in this area. This result is interesting because of the rather close general association in foods of vitamin B_1 and other members of the B complex. In contrast riboflavin, another member of the B complex, appears to be deficient with fair frequency, and pellagra which is related to another member of the B group, nicotinic acid, is known to exist endemically in the area.

As might be expected a low incidence of vitamin D deficiency has been found even in the winter-spring examination.

Finally, as evidence of the generally

mild nature of the deficiency states, it may be observed that no cases of frank, fully developed scurvy, beriberi, pellagra, or vitamin A deficiency have been encountered, and a relatively small number of cases of rickets and nutritional edema have been found.

CONCLUSION

In conclusion, I have indicated the public health nature of the procedure of assessing the nutrition of a population and described the methods which we have employed to make such an assessment. Certain preliminary results have been presented, but no attempt will or should be made to draw any final conclusions from them. They have been presented for what they are, incomplete, preliminary, partially analyzed data obtained by the methods I have described.

Although few cases of advanced or severe nutritional deficiency diseases have been found, let me warn that this fact should not lead to the conclusion that the milder deficiencies which have been found are unimportant. They are important and in many ways are more important than frank, fully developed deficiencies. To begin with the milder deficiencies are much more numerous, as our studies indicate. Less obvious, they remain unsuspected and their effects, including those which are remote and indirect, may be more serious. For the same reason they are likely to remain uncorrected unless studies such as I have reported disclose their presence and the need for correction.

Simplification of Records Through an Analysis of Procedures*

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MOST of you will agree that the record keeping required of public health workers is out of all reasonable proportion to the main function of our health organizations. The need for simplification does not have to be argued with you. We are interested now in how to introduce the requisite simplification without losing sight of the safeguards that must be observed when we try to substitute practices which are less costly in time and more helpful to personnel. It is the purpose of this paper to outline basic considerations in the development of a well integrated, convenient, and effective set of records.

During the past year, under the sponsorship of the Committee on Records and Reports of the State and Provincial Health Authorities of North America, and with financial aid from the Commonwealth Fund, the U. S. Public Health Service, and the Children's Bureau of the U. S. Department of Labor, a field staff directed by the authors of this paper has assisted eight states with their record systems.

In the states visited by the field staff it was evident that previous efforts toward a more effective use of records had been directed principally toward the mechanics of the system, the preparation of manuals, the arrangement of forms, and the instruction of clerical personnel in the uses of the system. These efforts undoubtedly increased the utility of the records for local health department personnel. In the opinion of the authors, however, such measures do not strike at the heart of simplification of records.

Cumbersome record procedures, inept and needless forms, unnecessary duplication of information, vague understanding of the purpose of records, as well as the ineffective use of records, are essentially problems which can be corrected only by better management.

To remedy the ills of record keeping so that the system becomes a real asset to the ease and effectiveness of conducting an organization's work requires, as an initial step, an examination of the personnel, administrative functions, and structure of the organization that the records are to serve. While the importance of studying mechanics alone, particularly the details of item arrangement, size and number of forms, and the amount of handling of records required under the prevailing procedures, should not be underrated, the disadvantage of such a study is that it tends to regard the record system as something detached from the essential administrative processes of the organization—something which, like the automobiles used by field workers, can be repaired or exchanged without material influence upon the quality or amount of health department service.

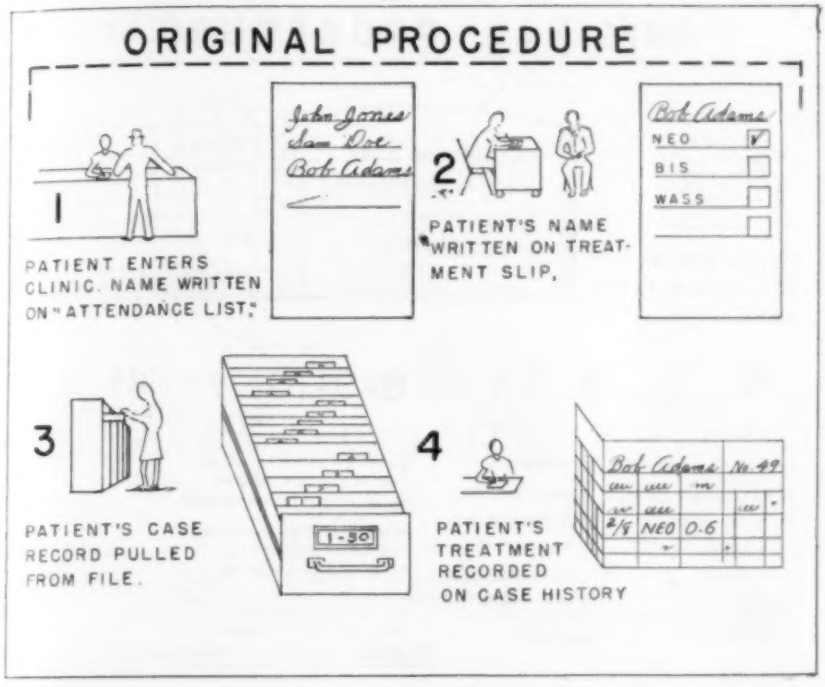
* Read before the Health Officers Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 8, 1940.

An examination of the mechanics of a system should be the last, rather than the first, part of an analysis of procedures aimed at the correction of problems. The inquiry should begin with a scrutiny of the program and the administrative structure of the organization as a means of determining the needs to be met. This should be done by getting those who direct or supervise a program to state the purposes of their activities and the relationship of special activities to the total program, together with a description of the procedures to be followed in achieving aims. If, as occasionally occurs, objectives are ill defined and the activities are carried on in a perfunctory and rather aimless manner, it is quite certain that the accompanying record practices will be equally meaningless. In the absence of purposeful activity or of some well defined and acceptable aim, there can be no justification for a record since its rôle is to expedite achievement of these very things. The determination first of the existing needs has the advantage of bringing to light those records that have no defensible use or those that are inappropriate for the program they are intended to serve. In illustration of this point, consider, for example, how the need for a student health record is related to the characteristics of the school hygiene program. A program having as its principal objective the periodic physical examination of each student would have few, if any, record requirements in common with the department whose program embraces dental corrections, immunizations against smallpox and diphtheria, and the placing of each child in the hands of a physician when deviations in physical or mental health are observed by the teacher or nurse. In the former instance, it is doubtful if anything more than a list or tally is required. In the latter instance, provision needs to be made for the recording of observations and services for each student by at least three types of personnel.

Administrators have felt that many of their records were impracticable, when, in reality, they were well suited to the proper conduct of the work. The difficulty was not in the records but in the staff members' lack of acquaintance with the aims of the department and the detailed procedures they were expected to carry out. Under these circumstances any carefully planned set of records, no matter how well integrated, is likely to seem needlessly complex and lead to the keeping of records as an end in itself rather than as an aid to easier and more effective work. The answer, of course, lies in the expansion of in-service training activities and not in a change of records. It should be emphasized here that most record problems originate in the inadequate provisions made by health administrators for teaching their staff the duties each member is to fulfil in a given program.

Furthermore, the difficulties arising from lack of knowledge of staff workers, which contribute to needless record keeping, are reflected in the attitude many of them have toward records. Notes and entries are frequently made which are of no consequence in furthering the purposes of the organization. Again, the explanation probably lies not in the record system but in a neglect to teach the workers that entries on a record should be governed by a decision as to their usefulness. Unless the entries permit a quality or a volume of service that otherwise would not be given, the time spent in recording notes should be used in other ways. Thus, it is only as a record system is reviewed in relation to the attitude and knowledge of the workers who are to use it, and in relation to local administrative needs, that many of the factors complicating the satisfactory operation of the system will be uncovered.

The more detailed consideration of

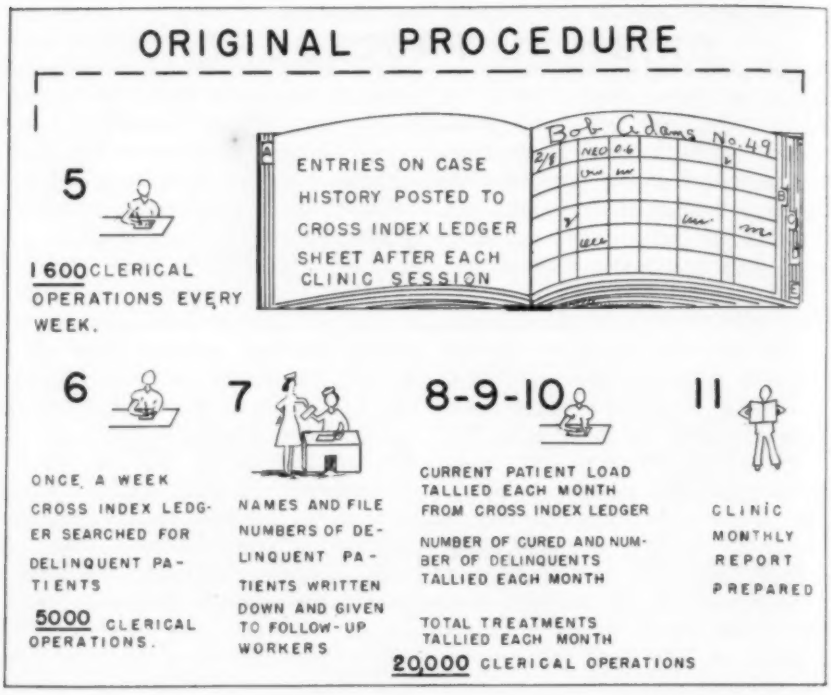


the design of the form, consolidation of forms, filing arrangements, and office routine hinges upon an observation of the professional and clerical procedures followed in the conduct of each activity. An inventory of the various steps each person takes in carrying on his work is essential in ascertaining the suitability of the record practices. Such inventory should be accompanied by a chart showing not only the flow of work but also the frequency with which each operation occurs and the time required for doing it. Final judgment on the suitability of practices already in operation depends upon a listing of possible alternate practices which would meet the administrative requirements of the situation, and a weighing of the relative cost of each alternate course in terms of time or the amount of clerical work. Although several examples might be profitably included, we have chosen to present only one—an abbreviated outline of the record keeping procedure followed in a venereal disease clinic.

The clinic director had three requirements he wished his record system to meet: (1) there was the need of information for guiding the care of each patient; (2) there was need of a means for revealing promptly the names of delinquent patients; (3) he required a convenient method for assembling the information necessary for the monthly clinic report to the Public Health Service.

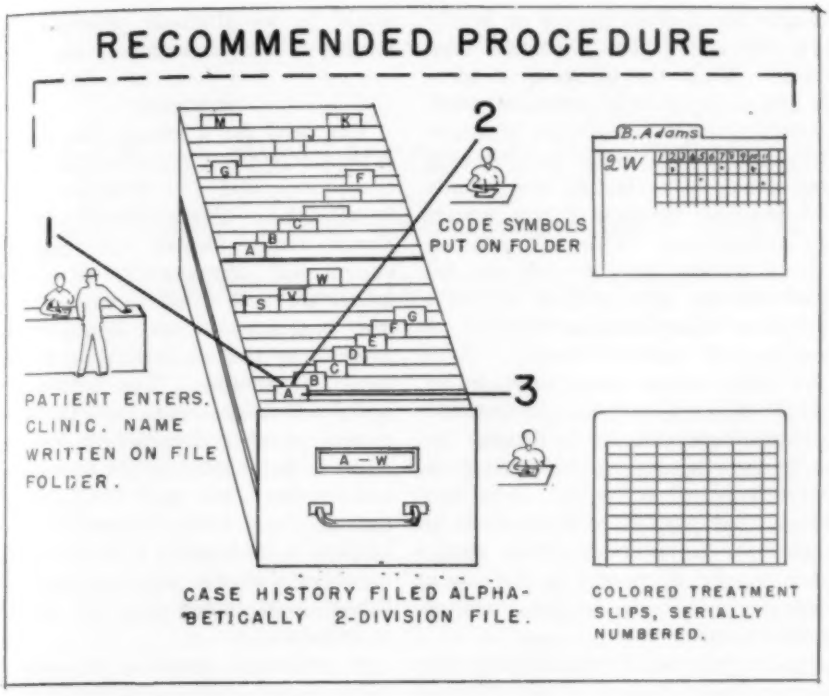
The procedures followed are presented in two charts. In Chart 1 four procedures are pictured. Nos. 3 and 4 are the same as would be found in any clinic; there was a case record for each patient and a file for these records. The point to note, however, is that the numerical arrangement used for filing case records necessitated an alphabetical cross-index file.

The cross-index file, which was in the


ORIGINAL PROCEDURE
5
1600 CLERICAL OPERATIONS EVERY WEEK.
ENTRIES ON CASE HISTORY POSTED TO CROSS INDEX LEDGER SHEET AFTER EACH CLINIC SESSION
Bob Adams No. 49
6
ONCE A WEEK CROSS INDEX LEDGER SEARCHED FOR DELINQUENT PATIENTS
5000 CLERICAL OPERATIONS.
7
NAMES AND FILE NUMBERS OF DELINQUENT PATIENTS WRITTEN DOWN AND GIVEN TO FOLLOW-UP WORKERS
8-9-10
CURRENT PATIENT LOAD TALLIED EACH MONTH FROM CROSS INDEX LEDGER
NUMBER OF CURED AND NUMBER OF DELINQUENTS TALLIED EACH MONTH
TOTAL TREATMENTS TALLIED EACH MONTH
20,000 CLERICAL OPERATIONS
11
CLINIC MONTHLY REPORT PREPARED

form of a loose-leaf ledger, is pictured opposite procedure No. 5. For each clinic patient having a case record there was a corresponding cross-index record. Information regarding the type of treatment given was posted each week from the case records to the respective cross-index records. Since there were about 1,600 active cases in the clinic a corresponding number of clerical operations, consuming 15 hours of clerical time weekly, were involved in this duplicating procedure. At the end of every week the cross-index ledger was searched for the names of patients who had not reported for treatment. This necessitated inspecting each one of some 5,000 records since the cross-index contained the names of inactive as well as active cases. This procedure, together with the preparation of a list of delinquent patients for the follow-up service, required between 3 and 4 hours of clerical time each week. The monthly clinic report calling for various types of information was prepared by thumbing through the cross-index ledger at the close of the month and making a series of tallies. Over 20,000 clerical operations and 30 hours of clerical time were involved in this procedure. Altogether the work of maintaining the cross-index, of finding who the delinquent patients were, and of preparing the monthly report accounted for approximately 100 hours of clerical time a month. The work was distributed unevenly over the month and workers who were responsible not only for this clerical work but also for follow-up on delinquent patients were often handicapped in dealing with urgent cases.

By relatively minor changes, involving principally the rearranging of filing procedures and the writing of code symbols on the outside of the case-record folder, it was possible to eliminate 6 of the 11 clerical procedures



involved in this set-up and to provide the essential information sought by the clinic director.

The follow-up workers were released from approximately 70 hours of clerical work, and their remaining clerical duties were evenly distributed throughout the week and month.

Essentially, the change involved the re-filing, after each clinic session, of case records in a separate section at the back of the complete clinic file. Thus, at the end of a week the only records remaining in the front part of the file would be those for delinquent, discharged, or "vacation" cases. Colored slips of paper designating the treatment received by each patient attending the clinic, together with information recorded on the front of the case folders, permitted a convenient and satisfactory enumeration of each month's activities. The former time consuming operations resulting from transcription of information and repeated inspections of the same records were thus eliminated.

Probably the most frequent shortcoming encountered in analyzing a record system is the lack of integration of various records comprising the system. In designing record forms there is a strong tendency on the part of administrative personnel to think in terms of the problems or activities in which they are primarily interested, rather than in terms of the persons doing the work, who are usually not permitted to confine their efforts to a single type of activity.

This shortcoming has frequently led to the separation of information pertaining to the same person, household, or premises as, for example, using separate files for medical, nursing, and sanitation records. If there is not a large amount of duplicate information on several records, reviewing all data

available for a given person or family when the need arises, becomes very tedious. While the directors of services and of supervising personnel speak of integration of services and of teamwork, the physical basis for realizing these aims, in so far as the records are concerned, hampers if not defeats their achievement. This will continue to be a problem until records are designed with the whole picture of health department aims in mind instead of those for each special activity.

We could recount many examples of how the services given by professional staff members can be facilitated by eliminating the separate recording of various types of activities. It is not, however, our purpose to relate them in detail but to point out that weaknesses can be discovered if there is a desire for efficiency on the part of administrators.

Another measure for simplifying records requires a perusal of the files to learn the frequency with which combinations of services have occurred. For example, if the majority of mothers and children admitted to nursing service have also been admitted to medical conferences, then worth while savings in the time necessary for copying information from one record to another may be effected by combining the two records. On the other hand, if relatively few of the nursing admissions are clients of the health department's clinic, very little effort is lost by having separate forms, although a consolidation of forms within the nursing service would be an alternate possibility deserving of serious consideration.

SUMMARY

The need for a record hinges upon three factors: (1) aims, (2) work procedures, and (3) structure of the organization. Among health departments these factors are markedly varied, and consequently the records which are well fitted to the needs of one organization are frequently ill adapted to the administrative requirements of another. The tendency of health administrators to copy the record system of other departments has been responsible for much of the unnecessary and fruitless paper work now prevalent. An additional cause of needless record keeping is the neglect to acquaint staff members with the administrative need behind each record they are required to maintain.

A necessary measure for relieving public health staffs of excessive record keeping is to design records to fit the needs of the particular organization in which they will be used—that is, use a " tailor-made " in place of a " custom-made " system. This involves a clear definition in the minds of all staff members, both new and old, of the aims of the department and of the work procedures to be followed in pursuit of those aims. Further simplification of record keeping rests upon a study of the sequence of operations and the time required for each, and finally upon a study of the possible alternate courses for eliminating or reducing needless steps.

What Can the Dental Health Worker Teach Regarding Nutrition and Diet?*

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THAT there is great need for judgment, discrimination, and careful statement in dental health teaching is very evident because of the many conflicting statements which occur in the literature. What is the health worker or the public to believe about nutrition and diet? Unfortunately, statements of opinion or theory are often given as facts, or are soon repeated as facts, and it is hard to overtake these statements, even when competent research has proved them to be false. Thomas Huxley once said: "There is nothing more tragic than the murder of a big theory by a little fact and nothing is more surprising than the way in which a theory will continue to live long after its brains have been knocked out."

It should be understood at the outset that the writer is not and never has been a research worker in nutrition or dental histology, pathology, or bacteriology. After some years in private practice, he has been for more than 20 years employed in public health dentistry. His task is to keep informed concerning the results of research as it pertains to dental health, evaluate this as best he may, and interpret it for the benefit of his public health coworkers and the general public.

Commercial advertisements are guilty but they are not the only offenders. Last year a dental committee examined the dental content in about 80 textbooks on health intended for use in schools, but did not find one text wholly acceptable, and most had much false teaching in regard to teeth. The writers have not been entirely to blame. Dentists, dental health workers, and dental research workers have all been too prone to make positive statements which should have been qualified.

The relation of nutrition to dental caries first came prominently to the attention of health workers and research investigators with the work of Percy Howe in Boston and May Mellanby in England some 20 years or more ago. Howe's experiments on rats, guinea pigs, and monkeys, and Mellanby's on dogs seemed to show a distinct relationship. Experiments in this direction were soon being carried out in a number of laboratories. Research workers grasped this lead in the hope that here at last in the field of nutrition might be found the means of preventing the ravages of dental decay.

There is not time and it is not necessary in this paper to give in detail the results of these investigations. We shall select only a few opinions from those most often quoted, typical of the wide divergence.

Howe [1] has maintained that vitamin

* Read at a Joint Session of the American School Health Association and the Food and Nutrition Section, and Oral Health Group of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 11, 1940.

C is the most important protective agent and that dental caries is retarded by use of a fortified diet in which vitamin C is high and cereal intake low.

Mellanby [2] believes vitamins D and A and mineral salts most important, especially calcium and phosphorus, along with a reduction of carbohydrates.

Hawkins [3] of Los Angeles reports arrest of caries with an adequate diet well fortified with fruits and green vegetables but low in cereals and sugar. He believes this due to increase in alkaline elements in the saliva and that the acid base and calcium phosphorus balances are most important. Martha Jones [4] of San Francisco agrees with Hawkins and believes that excess of alkali elements over acid is the controlling factor.

Boyd [5] of Iowa University believes that "complete and optimum nutrition offers the teeth full opportunity to resist destructive agencies."

The Michigan group [6] (Bunting, Jay, and coworkers) emphasize the rôle of *Lactobacillus acidophilus*. This group claims that a close diagnostic relationship exists between oral lactobacilli and dental caries activity, and that the consumption of carbohydrate, particularly refined sugar, favors the growth of lactobacilli in susceptible individuals, thereby stimulating caries activity.

We have thus listed briefly the theories that are being advanced today as to the rôle of nutrition or diet in the cause or control of dental decay.

It will be seen that these emphasize the following as most important: vitamin C; vitamins D and A; calcium/phosphorus balance; alkali/acid balance; optimum nutrition; reduction of the carbohydrate intake, especially sugars.

At first glance this looks like a very confusing picture, but is there not some common denominator, or are there not some points on which there is practical unanimity of opinion? We believe that such is the case.

In the first place, we can say that there is very general agreement today as to the nature and course of dental caries as set forth more than 40 years ago by Miller, an American dentist in Berlin working in the laboratory of the renowned Koch. Fosdick and Wessinger [7] of Northwestern University say that "at the present time most research workers believe that it is a chemical bacterial phenomenon and that systemic factors merely contribute to or alter the local environment," that is, acid formed by the action of certain organisms on carbohydrate dissolves the mineral content of the enamel and dentine to cause decay. This was Miller's conclusion.

For the practical purposes of this paper we can omit the discussion as to which organisms are the most important in this process. It is interesting to note, however, that Becks and Wainwright [8] of the University of California report experiments made last year upon a large group of students to test the theories of the University of Michigan group and report complete confirmation as to the rôle of lactobacilli and carbohydrate. Waugh of Columbia, who has made many trips to Labrador and Alaska to examine the teeth of Eskimos, reports decay unknown as long as the Eskimo subsisted on the native diet, but when he eats "civilized" food, decay soon becomes rampant. He gives the three exciting causes as refined wheat flour, sugar, and molasses. He describes his researches very interestingly in a recently published radio address with the heading, "An Unsweetened Tooth Cannot Decay!" [9] It is also interesting to note that Waugh started out with the conviction that an optimum diet was the important thing, but these studies caused him to change his mind. The researches of Price on native peoples would also bear out Waugh's conclusions. Fosdick [10] reports the rapid production of acid on susceptible tooth surfaces within ten minutes

after the ingestion of a candy bar. He concluded from this observation that the acids of caries were produced almost as soon as the candy was taken into the mouth.

We find too that in the experiments carried on by those claiming vitamins A, C and D, calcium/phosphorus balance, alkaline base, and optimum diet as the important factors there has been in every case a reduction of the carbohydrate intake. Some of these investigators reduced the carbohydrates not because they believed it important in the control of caries, but because they believed it necessary in order to have other important foods eaten in proper amounts. The candy and cereal crowded out other necessary items. Boyd says, "It is important to recognize that the amount of carbohydrate eaten daily by the average child is considerably in excess of that we prescribe for normal child nutrition." In fact, the statement has been made that no research group has ever controlled caries in the human subject on a high sugar diet.

Jay [11] calls attention to the National Confectioners' Association which has distributed literature throughout the land citing a rat experiment in which high amounts of sugar in the diet failed to cause carious teeth, with the inference that sugar is not harmful to human teeth. They failed to tell the whole story. Research on rats [12] has shown that for them the important factor in producing caries is fine or coarse food. A diet of the highest nutritional value to which has been added some coarsely ground corn or rice resulted in caries in all the rats that ate it. The addition of sugar increased the rate of decay. A diet which lacks the bare necessities of life will not produce caries in the rat if it contains no coarse particles. The high sugar diet fed to rats reported by the Confectioners' Association contained no coarse particles. It is not always possible to draw conclusions for the human being from animal experiments alone. There may be factors which are very important in one case and not in the other, as this research well shows.

We see then that there is at least one common denominator in all the research that claims reduction of dental caries in man by dietary means, and that is the reduction of carbohydrate, especially in the form of refined sugar. Evidence is increasing every year in this regard. Here in this instance the old adage repeated for centuries has proved to be correct. Nina Simmonds [13] reports Aristotle, who lived more than 300 years B.C., as asking why soft and sweet figs damaged the teeth and also that Tolver in 1752 wrote: "All kinds of sweetmeats and sugar contribute very much to the destruction of the teeth."

We still have the apparent contradiction in the few people who can eat candy and sugar and yet do not have dental caries. The answer seems to be that the mouths of such individuals will not tolerate organisms associated with caries. Would that our research workers might find the cause and how to produce this immunity in others. So far their efforts in this direction have not succeeded. The number of such "immune" individuals is very small—perhaps not over 3 per cent.

Something should be said also in regard to the prevalent teaching today concerning the importance of nutrition for the expectant mother, both for her unborn child and all through life, in order to "build or maintain strong teeth." Such statements are made on assumptions which do not take into account the histology of tooth formation. The work of Kronfeld and Schour [14] with the discovery of the neonatal ring shows that only a very little calcification of teeth takes place before birth, and that the outer portion of the enamel of deciduous teeth is not formed until after birth. They say there

is no evidence for and much against the importance of prenatal diet so far as the teeth of the expected baby are concerned. Of course an adequate diet for the expectant mother is very desirable for other reasons, but we should not attempt to secure this with statements that are not borne out by the facts. There are too many unfavorable reactions later from disappointed mothers, as many dentists can affirm.

In building well formed teeth the important time that diet can play its part is from birth to 8 years of age—14 if we include the third molars or wisdom teeth. Teeth are not like bone, capable of continued nutrition and self repair. After the crowns of teeth are once formed, Kronfeld [15] says they "have just as good or just as bad a structure as they are going to have for the rest of their life." We know too that often children with the best quality of teeth have rampant decay, and again children with very poor quality have no decay at all. Mottled teeth caused by fluorine in the water is a case in point.

In view of these facts and our clinical experience, we believe that the idea of feeding teeth to improve their structure so as to prevent decay is questionable at any time and, after the teeth are once formed, simply indulgence in wishful thinking.

Here again the importance of an adequate diet for growth, development, and health is not questioned. We are only attempting to discourage statements concerning nutrition and diet in regard to teeth that are not in accord with present known facts. Of course we deplore but cannot prevent statements contrary to fact or in question from commercial organizations interested only in selling their products; but health workers, including those who write chapters for health textbooks or articles for lay education, should not be a party to this deception. We know that they do not do so intentionally and we have all been more or less guilty in the past when we accepted statements that we supposed were true but which seem not to stand more thorough investigation.

We plead then for careful statements from all health workers. The public may expect exaggeration or misstatement from some commercial sources, but they look to the health worker, who should be unbiased, to tell the truth.

What then can the dental health worker teach in regard to nutrition or diet?

We believe he should teach the importance of a well balanced diet, such as is generally accepted today by competent nutritionists and physicians as important for general body growth, development, and optimum health. All health workers should lend their aid in emphasizing this.

We believe that he should say that the period from birth to 8 years of age is the time when nutrition can play its most important part in building well formed teeth, but he should warn against the idea that any known diet today can guarantee the building of teeth impervious to decay. He can say that a well balanced diet is important in treating or preventing some forms of gingival disease, such as scurvy.

We believe that he should discourage the use of proprietary preparations to supply the necessary calcium and phosphorus. These can best be supplied in a well balanced diet, as most investigators will agree.

We believe that he should teach the importance of the reduction of sugar and sometimes other carbohydrates for the control of dental decay and because the usual American diet is unbalanced by too much carbohydrate.

We realize very well, however, that if sugar is the great offender in the cause of dental caries, as seems to be the case, we have a very difficult task ahead in making much progress in its

control by the reduction of sugar intake so far as the mass of people is concerned. Most people would prefer some decay rather than to eliminate the sweets. The per capita consumption of sugar in the United States has increased something like 100 pounds per person in the past 100 years. But some will heed and some progress is being made, as is evidenced by many a story. We should keep up the admonition and give the evidence as to its harmful effect on teeth. At the same time, let us hope our research workers discover a more practical means of controlling or preventing dental decay.

In other words, we believe that, no matter what theory is accepted today as to the rôle of nutrition in dental health, from a practical standpoint we may all talk the same language.

Though this paper deals only with nutrition and the diet, we cannot refrain from mentioning the other factors in a good dental health program. Early and periodic care by a conscientious and competent dentist, starting at 2½ or 3 years of age, cannot be overemphasized in the promotion of dental health under present conditions. Proper and regular use of the toothbrush is also desirable not because it will prevent decay, but because it can aid in reducing decay on the exposed surfaces of the teeth, and also aid in maintaining healthy supporting tissues.

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Advances in Methods of Murine Typhus Control*

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THE increasing widespread incidence of murine typhus fever in the United States, and especially in Georgia, has gained sufficient momentum to attract considerable interest as a major public health problem. A state-wide typhus fever control program for Georgia was organized by the Georgia Department of Public Health in July of 1937.[1] The control measures adopted were, in general, based on the rat control methods employed by the U. S. Public Health Service in the eradication of bubonic plague from our western and Gulf Coast cities, and on the most recent Public Health Service publication on rat proofing of buildings.[2] These control measures consist of rat proofing of buildings, garbage control and clean-up of premises, and rat extermination. Studies previously reported[3] showed that the greatest typhus problem in Georgia is in the small towns and villages and, to a lesser extent, in large cities. After 2 years' operation of the typhus control program, certain modifications in the application of control measures have been made in an effort toward making the control program more effective.

RAT PROOFING

Rat proofing, the permanent typhus control measure, is effectively applied to individual buildings. It consists of preventing the ingress of rats into buildings, and the elimination or protection of all enclosures within buildings that may provide hiding and nesting places for rats.

The procedure first followed in Georgia was to make surveys of individual business establishments to ascertain the existence, character, and location of rat harborages, and the extent of rat infestation. Written reports, based on these surveys and outlining in detail existing conditions and needed corrections, were prepared and submitted to the owner or tenant of the business establishment.

The cost of rat proofing an entire business establishment, although small in many instances, would be prohibitive in others, especially in old buildings in small towns and villages. Hence, the speed at which rat proofing could be accomplished was not very great. Other factors affecting the program were the need for close technical supervision and the fact that officials of the average city, town, or village were reluctant to participate financially or to enforce regulations because of the high cost of the work involved. It therefore became obvious that rat proofing buildings, on a state-wide basis, was a long-term program requiring many years' work before any appreciable results, as measured by a reduction in the incidence of typhus fever cases, could be obtained.

* Read before the Engineering Section of the American Public Health Association at the Sixty-ninth Annual Meeting in Detroit, Mich., October 10, 1940.

Many buildings were partially rat proofed, with only a small percentage of building owners complying fully with all the recommendations in the reports made to them. In those buildings partially rat proofed, it was observed that the merchants experienced a great reduction in rat infestation, and in many instances, a complete elimination of rats took place. In general, the average merchant coöperating in the rat proofing program did so voluntarily, and he was reluctant to go to any additional expense for rat proofing his entire building if partial compliance gave him a marked reduction in rat infestation.

In view of these experiences, the need was felt for some modification of our rat proofing program, one that would be relatively inexpensive but still effective, that could be applied in a comparatively short length of time to all business establishments in a city, and that would be practical for municipal governments to participate in financially and through the enforcement of regulations. A program of vent stoppage was therefore designed [1, 4] to meet these requirements.

VENT STOPPAGE

Vent stoppage, as the name implies, is the closing or protection of openings in the exterior walls of buildings to prevent the ingress of rats (Figure 1). Basically it is a part of rat proofing, but must be applied to all adjoining buildings, in a given area, in order to obtain the most effective results. In municipalities, the principal rat harborages are buildings which have unprotected openings in the exterior walls, such as those for ventilation, pipes and cables, and those due to deteriorated walls and around doors and windows that do not fit snugly. Openings of this nature serve as active points of entry into buildings, and are the main

FIGURE 1—Vent Stoppage—Rear of Business Establishment Protected Against the Ingress of Rats

lines of travel for rats between food supplies in adjoining buildings and alleyways and their harborages inside. Vent stoppage therefore serves as the first line of defense against rat invasion of buildings. It was first applied in the City of Camilla, Ga., in May, 1939.

Vent stoppage is accomplished by first making surveys of all business establishments in a municipality. The surveys are based on actual conditions found for each business establishment, and special forms are used to record the information secured (Figure 2). This is necessary to determine the materials needed and the cost thereof for each establishment in order that correct estimates may be submitted to city officials. The surveys are based on actual conditions found at each establishment and special forms are used to record the information secured. To permit a rapid estimate of the amount of metal flashing needed to protect a wooden door, door jambs and sill, the following empirical formula is used:

$$N\,(0.1\,W + 1) + 2 = \text{sq. ft. metal required}$$

Where N = No. of sections in door
W = Width of section in inches

To protect the edges of doors against rat gnawings, 24 gauge galvanized sheet steel is used and installed in the manner as shown in Figure 3. To facilitate the bending of metal for door flashing, we have found that inexpensive brakes, as shown in Figure 3, can be easily made. The wooden type brake costs approximately $5.00,

FIGURE 2

TYPHUS FEVER CONTROL

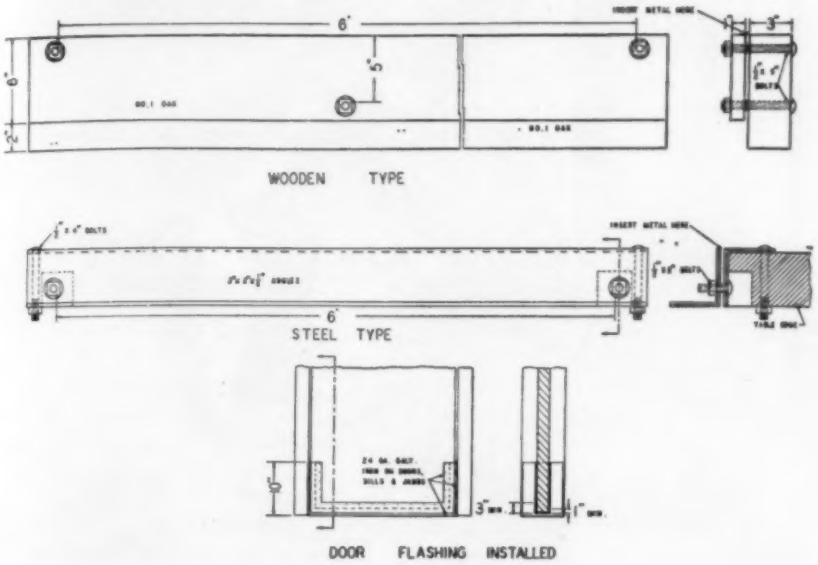
VENT STOPPAGE SURVEY
CITY OF MACON, GEORGIA

SHEET NO. 6
BLOCK NO. J
DATE 4-24-40

Unit No.	Business Name	Type	Doors: No.	Doors: Sections No.	Doors: Sections Width In.	Doors: Sections Metal Sq. Ft.	Ventilators: No.	Ventilators: Size of Opening Sq. Ft.	Ventilators: Vent Required Sq. Ft.	Windows: No.	Windows: Width In.	Windows: Ht. In.	Windows: Metal Sq. Ft.	Windows: Hdwe. Cloth Sq. Ft.	Windows: No. Brick	Misc.
36.	CLIFF WALKER MOTORCYCLE CO.	Auto														
	Front						1	21 x 21	4.0							
	Side		1	1	36	6.6				2	46	—	17.2			
			1	2	48	13.6	3	13 x 42	12.0	2	50	104		75.0		25 bd. ft. lumber
			Rebuild door sill													
	Rear		Point up door sills with mortar													
	Comment: Install metal flaps on two mail chutes. Point up masonry in front.															
37.	BIG STAR STORE	Food														
	Side						4	19 x 48	28.0							
	Rear		1	1	42	4.0	(no metal required on concrete sill)									
							3	10 x 44	11.0							
							3	14 x 48	14.0							
	Comment: All goods and equipment in basement should be stored on open racks 18" above floor.															
38.	BARBER SHOP	—	1	1	36	6.6				5	48	—	4.8			(use 1" x 1" metal angle)
39.	MACON FEED STORE	Food														
	Front		Seal up ventilators. Install astragal on door. Install metal flaps on mail chute.													
	Rear		1	1	40	4.0	(no metal required on concrete sill)									
							1	10 x 48	4.0	3	44	44		41.0		
40.	PEACH STATE HATCHERY	Food														
	Front		Repair sidewalk. Point up masonry wall.													
	Rear		1	2	30	10.0										
			2	2	36	18.4	(Reset this door to fit within 3/4 in. of sill and jambs)									

Georgia Department of Public Health 206 # 1—2M—5-18-40

FIGURE 3—Inexpensive Types of Metal Bending Brakes Used Principally for Door Flashing in Vent Stoppage



whereas the steel type costs approximately $6.00.

Care is exercised in replacing all decayed portions of doors and door facings before flashing, in order to secure permanency of the work. It is important that doors should be installed in open stairways and kept closed at night to prevent the entrance of rats. Flashing front doors on a busy street is usually unnecessary, because when such doors are installed so as to fit snugly, rats have rarely been found to gnaw through them.

Ventilator openings in foundation walls are often main points of entry into buildings for rats. In the majority of buildings that we have inspected and found to be rat infested, ventilator openings were found in which metal grills were either removed, broken, or had never been installed. To protect these openings properly, materials are used that will be lasting in quality, such as perforated galvanized sheet steel of 14 gauge, or heavier (galvanized after perforating), expanded metal of 18 gauge, or heavier, or cast iron grills. Perforations or openings in the grill are never larger than ½ in., thus insuring protection against the entry of rats and still allowing ample circulation of air through them. Many old buildings contain over-size ventilators and abandoned windows in the foundation walls. These are partially closed with masonry, and in the remaining opening metal grills are installed, thereby giving ample ventilation to the building, with an appreciable saving in the cost of materials.

To protect windows, especially those which are close to the ground, against rat entry and at the same time not reduce appreciably the amount of light passing through them, 16 gauge galvanized wire cloth of ½ in. mesh is used. The wire cloth is installed for the entire height and width of the window.

Miscellaneous openings, like those through which pipes, cables, and drains pass, and those caused by the deterio-

FIGURE 4—Vent Stoppage—Galvanized Metal Curtain Wall Installed by J. C. Pittman, Sanitarian, Ware County Health Department

ration of walls are sealed with brick, cement, metal, or concrete. Great care is exercised in properly sealing or protecting abandoned sewers and drains leading into buildings.

In the case of buildings of wood frame construction in small towns and villages, vent stoppage is usually more expensive than for buildings constructed with masonry walls. The reason for this is that the space underneath the floor must be closed with a curtain wall of galvanized metal or masonry extending 24 in. below the surface of the ground (Figure 4), or the building must be elevated at least 18 in. above the ground surface. All other openings are closed or protected in a manner similar to that for buildings having masonry or concrete walls.

Vent stoppage is applied to buildings under construction by extending the foundation walls to a depth of not less than 24 in. below the outside ground surface. Openings such as doors, ventilators, and those for soil pipes, cables, and the like, are protected in the same manner as for existing structures.

The three methods that are currently employed for financing vent stoppage programs are listed below in the order of their effectiveness and desirability:

1. Municipalities furnishing all labor and materials
2. Municipalities furnishing labor and individual merchants furnishing materials
3. Individual merchants furnishing all labor and materials

The first method insures uniformity in workmanship and the completion of all required work in the shortest period of time. The use of the second method,

although insuring uniform workmanship, delays the completion of the program due to the fact that necessary materials, for individual business establishments, are not always available when needed. The third and least desirable method often fails to provide both the proper materials and the uniformity in workmanship, and consequently entails a long delay in the completion of the program.

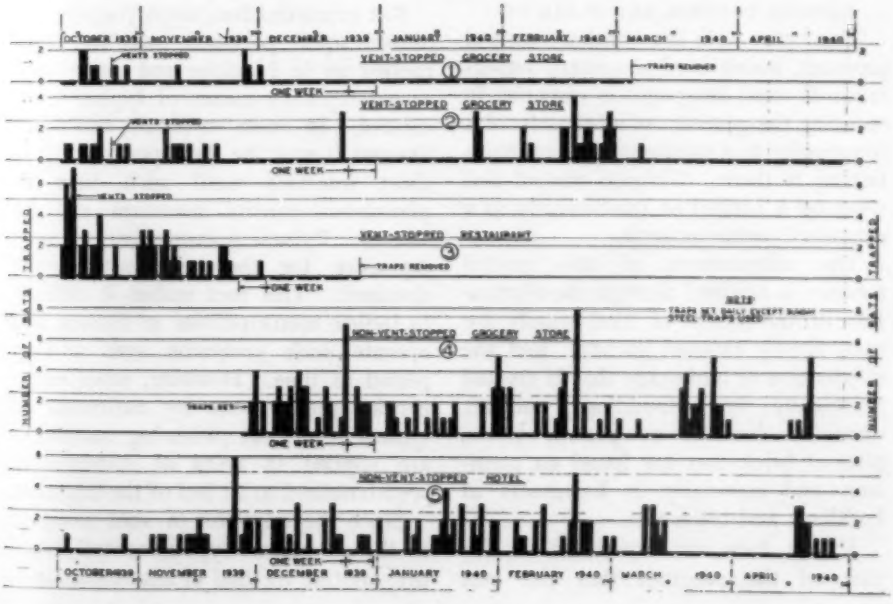
Suitable ordinances have been enacted by municipalities in Georgia as a means of aiding the completion and maintenance of vent stoppage programs, as well as to provide for vent stoppage of proposed new buildings.

Since the beginning of the vent stoppage program, 19 cities and towns ranging in population from about 900 to 16,000 have coöperated in it, and work on 1,107 business establishments has been completed. The average cost of materials based on these figures was approximately $3.00 per business establishment, and the average man-hours of labor required for each was 9.5.

In Sylvester, Ga., a vent stoppage program was started in October, 1939. Sixty-two business establishments comprising the entire business district of the city were vent stopped with the result that, at the present time, approximately 93 per cent of these buildings are comparatively free from rats. Trapping of the rats blocked within those establishments was carried on immediately following the completion of the vent stoppage program. This was done not only to clear the buildings of rats, but also to determine the effectiveness of vent stoppage.

Figure 5 shows rat trapping results in four food handling establishments selected as representative of such types of establishments in the business district of Sylvester. In Figure 5, graphs one, two, and three of vent-stopped establishments show the absence of rat life after the passage of about 6 weeks following the completion of vent stoppage. They also indicate a variation in the degree of rat infestation. Graph number two also shows that rats invaded that establishment on or about

FIGURE 5—Rat Trapping Results in Vent Stopped and Non-Vent Stopped Establishments



December 22 and again on January 25. This was, in all probability, due to a rear door being kept open all day and until late at night, for after the installation of protected swinging doors, followed by more trapping, the evidence of rat infestation again disappeared. Graphs four and five of non-vent-stopped establishments show the continued presence of rat life over a trapping period of 6½ months.

It is realized that vent stoppage, like rat proofing, does not insure against the invasion of rats by accidental means. However, if vent stoppage is properly maintained, business establishments may be kept free of rats by occasional trapping.

Vent stoppage as a rat and typhus control measure has met with favorable reactions from many of our cities and towns in this state. The work has been viewed by municipal officials for the effectiveness of the program, and, as a result, 20 additional cities and towns, including some of our largest cities, have made official requests for assistance in starting similar programs.

GARBAGE CONTROL AND CLEAN-UP

This part of the typhus control program, which is of secondary importance to vent stoppage, is essential in reducing the general rat infestation of a community to a minimum and in maintaining it there. Garbage control and clean-up is carried on continuously as a community-wide activity.

The effectiveness of this control measure is attained through the elimination of the source of food supply for rats, chiefly exposed garbage, and the elimination of harborage that is created principally by outbuildings, rubbish, discarded lumber, equipment, boxes, piles of brick that are found on premises, and especially in basements of buildings and residences.

It has been our experience in this part of the program that the best results are obtained by informing municipal officials of the conditions that exist and by giving them the recommendations necessary for the correction of those conditions. Supplementing this action, intensified educational programs are carried on through the media of the press, radio, and personal and group conferences.

As a result of this part of the typhus control program, many cities and towns have increased the efficiency of their inspection services and of their garbage collection system by adding personnel and equipment. In addition, they have improved the enforcement of existing garbage regulations and the method of final disposal. They have become sufficiently interested in proper garbage control and general clean-up to realize that it must necessarily be made a permanent municipal service on a par with other routine activities. It has also been observed that a marked reduction in the general rat population has followed this work in those towns carrying on this part of the program.

EXTERMINATION

Rat extermination, employing the use of red squill poisoned bait, has been carried on in 23 cities and towns only as a temporary means of typhus fever control. In order to obtain full effectiveness it must be done periodically at short intervals until such time as permanent control measures can be started. Poisoning campaigns are very expensive for the temporary results obtained. This fact makes it difficult to induce municipalities to finance and operate such programs over a long period of time. However, when emergencies are created by outbreaks of typhus fever, rat poisoning campaigns are applied to areas of communities predetermined to be foci of the infection.

Since the adoption of vent stoppage as the permanent typhus control measure, another method of extermination—

trapping—has become increasingly important. Vent stoppage, if properly carried out, will obviously block a large part of the rat population of any business area inside the buildings, and it is often found necessary to employ some form of extermination in these buildings due to the complaint of merchants of the increased activity of rats. Especially is this the case with food handling establishments. Trapping is the most desirable means of accomplishing this purpose. It is relatively inexpensive as well as efficient in that usually only a very short period of time is required to eliminate all the rats blocked within a building. It also provides a means of removing rats from buildings each day, thereby eliminating any complaints from merchants because of obnoxious odors resulting from decaying rat carcasses. In addition, trapping serves as an excellent means of securing data for investigative purposes.

CONCLUSION

The murine typhus control measures as presented in this discussion are, we believe, in part responsible for the reduction of the incidence of this disease, which has occurred during the past year in cities and towns in which this program has been applied.

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Educational Qualifications of Industrial Hygienists*

IN Preliminary Survey of the Industrial Hygiene Problem in the United States (*Public Health Bulletin No. 259*), it is estimated that there are in this country approximately 50,000,000 gainfully employed persons exclusive of familial dependents whose health status is not only dependent upon the protective and educative services normally established as a part of a whole-time community health service, but who require particular attention because of their occupation and its relation to their health and welfare. While in past years the greatest conservations in human life have been made in the earlier age groups, there remains an astounding need for dealing with chronic diseases and the specific hazards which affect the industrial population.

The survey made by the U. S. Public Health Service in 15 states involving 16,803 plants and 1,487,224 workers offers a sampling of the health status of 3 per cent of the workers in the United States. From this sampling is obtained a general view of the specific exposures potentially inimical to health to which our industrial population is subjected. Approximately 2,750,000 workers are exposed to organic dusts; there are 2,250,000 workers exposed to "other metals"; more than 1,000,000 each are subjected to the hazards of carbon monoxide, petroleum products, silicate dust, dermatitis products, miscellaneous gases, and silica dust—to mention only a few of the most important hazards.

Since it is impossible and undesirable to create a definite cleavage between the general health problems of a community and those which pertain more directly to the industrial field, we feel that no steps should be taken to separate the training of industrial hygienists from the general program of preparing personnel for all phases of health service. Rather should there be created means to emphasize in addition to such fundamental training, special courses to acquaint the industrial physician, nurse, engineer, chemist, and health educator with this particular field. Thus, the physician who serves as plant health officer, who specializes in industrial toxicology, who directs the activities of an industrial hygiene bureau at federal, state, or local level; the public health nurse who becomes a member of the staff of the industrial medical service or who participates as consultant or specialist in industrial public health nursing and education; the public health engineer who is concerned with problems of environmental health; should all receive their basic training in their fundamental public health avocations. To such basic training should be added instruction in the special field of industrial medicine, hygiene, and sanitation.

* Preliminary Report of the Subcommittee on Educational Qualifications of Industrial Hygienists.

The Committee on Professional Education publishes this preliminary report to permit the members and Fellows of the Association to review it and to offer criticisms and suggestions in the further consideration of the report. This report, like all other statements of the Committee on professional and technical qualifications in public health, after approval by the Governing Council, is subject to period'c revision in order that it may be kept abreast of the best thought.

While it is true that the defense program tends to emphasize the urgent need for protecting the health of the industrial worker, we do not believe that this need is of any temporary character as the normal health problems encountered in industry demand that more emphasis be directed toward this field. Granting that an emergency may encourage many physicians, engineers, and nurses to direct their attention to and thus concern themselves with specialized training for industrial hygiene, possessing the basic and fundamental training and experience in the broad field of public health, these individuals will be readily absorbed in the extension of full-time state and local health service. Such local service now reaches only about one-third of the counties of the United States and is subject to material expansion in our states and urban areas.

A survey reported under date of March 1, 1941, by the Committee on Medical Preparedness, with the cooperation of the Council on Industrial Health of the American Medical Association, indicates that there are 4,981 physicians now engaged or who have had experience in industrial practice (the survey is not complete, only 6,332 replies having been received for 10,134 schedules mailed to physicians). A preliminary tabulation indicates that the majority of these physicians are engaged in general industrial practice, less than 1,000 on a full-time basis and more than 2,000 on a part-time basis. Of 4,434 schedules studied, but 24 physicians are engaged in occupational disease control work and only 8 of these on a full-time basis; 139 are concerned with plant medical department administration, 103 of these on a full-time basis.

The U. S. Public Health Service reports that of 23,705 public health nurses in the United States, 3,271 were listed as industrial nurses. Of this latter number 75 per cent had completed high school before entering a nursing school but only 3.9 per cent (40 individuals) had received one or more years of public health training.

As of mid-year 1940 there were in the state and local health departments 37 trained medical industrial hygienists, 81 engineers, and 37 chemists. At the same time there were employed by the U. S. Public Health Service 51 trained industrial hygienists, of whom 15 were physicians.

The above figures indicate not only the scope of the problem to be met and the specific nature of the potential health hazards, but how small is the personnel now available and how meagerly trained at academic level is such personnel.

The industrial hygienist should have fundamental training in the sciences and the humanities. The industrial physician should have a preliminary training similar to that of the health officer, and after his graduation in medicine should have supplemental training and field experience not unlike that of the health officer, with, however, major emphasis in the field of industrial hygiene and environmental health. Likewise the industrial public health nurse and the public health engineer who specialize in the industrial field should possess the basic training and experience common to other public health nurses and public health engineers, to which should be added specialized emphasis in the field of industrial service.

The committee does not feel that at this time it is desirable to suggest an inflexible curriculum or even a basic outline of a course in industrial health. In general, however, it may be said that in addition to his medical training and experience the industrial physician should have a good knowledge of community health problems; of epidemiology with special reference to the control of communicable and occupational

diseases; basic training in physiologic hygiene with special emphasis upon adult health, nutrition, and mental hygiene. He should also have a good knowledge of the engineering expressions to the physiologic problems of environmental health; should be acquainted with the technics and services of public health practice including health education, industrial relations, economic responsibilities, and public health law. He should be trained so as to serve effectively in directing rehabilitation services for handicapped individuals; should be acquainted with the technics of accident prevention and safety; and should be especially prepared to secure and maintain friendly and adequate relationships with welfare agencies, physicians, and dentists engaged in private practice.

The industrial public health nurse should have a broad training which encompasses the same general field as described for the physician, but with of course major emphasis in those services which fall within the purview and qualifications of a nurse. She should be prepared to serve as an assistant to the physician in clinic service; should have the ability to understand the social and economic needs of the employees in relation to the problems of the employer; and should take such courses as will prepare her to do a good job in the field of health education.

The public health engineer in industry should in his training and experience be exposed to the general problems encountered by the industrial physician but with additional technical training in the field of engineering, in the control of working environment with special emphasis upon the sanitation of working places, illumination, ventilation and air conditioning, and the control of industrial exposures. Likewise the chemist should have fundamental training in chemistry and public health work with added special emphasis upon industrial toxicology.

In conclusion, may we repeat that we do not feel that the industrial hygienist should be trained apart from the other groups which have chosen public health service as a life career. The industrial hygienist should be a part of the health personnel trained and experienced to deal with the broad problems of community health service. One cannot begin too soon in such training processes. It should be begun in our schools of medicine and engineering, carried forward at graduate level concurrently with field experience, and may endure by the creation of refresher or postgraduate courses which will keep the personnel attuned to the newer technical services and abreast with the field of public health as a whole.

SUBCOMMITTEE ON THE EDUCATIONAL QUALIFICATIONS OF INDUSTRIAL HYGIENISTS:

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PHILIP DRINKER

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PAUL A. NEAL, M.D.

The A.P.H.A. Membership Nomination Blank

On page XXI of this issue of the *Journal* appears a form to be used by members of the A.P.H.A. in nominating other persons for membership. This blank will be carried in the next few issues and we hope that every member will use it at least once.

Vol. 31

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and THE NATION'S HEALTH

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ACTIVE IMMUNITY TO TETANUS

IT seems likely that public health practice, in relation to the use of tetanus toxoid, is not quite abreast of the time. The possibilities of effective use of this material in the production of active immunity to tetanus has gone well beyond the research stage, and yet its application is quite limited and spotty in this country. Although the number of deaths reported from tetanus in the United States Registration Area in 1938 was only 930, the amount of tetanus antitoxin used annually is evidence that there are hundreds of thousands of wounds where the possibility of tetanus must at least be considered. This being so, and in view of certain limitations in the circumstances in which tetanus antitoxin may be used for the rapid creation of a passive immunity, it would seem that those in public health work would find tetanus toxoid a valuable addition to their armamentarium for preventive medicine.

In the course of research and field trials, it has been found that tetanus toxoid may be combined with either diphtheria toxoid or typhoid vaccine and injected together. This may be done without detriment to the antigenic properties of either substance. Some investigators maintain that the effectiveness of each is actually increased by injection of such mixtures. In any event, one does not need to institute tetanus vaccination as a separate series of injections, and pediatricians, in one place or another, are taking advantage of this fact. The dose is one cubic centimeter, the number of doses from two to three, the time interval from one to six months. As a measure of increased safety, it is advisable to give a stimulating dose of tetanus toxoid if and when the individual is wounded. Reactions are absent or mild. The length of time that a high titer of antibodies remains in the serum varies, but evidence points to the fact that even after some years, one dose of toxoid will in a matter of days bring immunity to an effective level.

From the evidence at hand the use of tetanus toxoid would appear to be a valuable procedure in the armed forces. The French Army introduced it some years ago, and there have been statements that it is a practice in the Italian and Russian Armies. In the English Army it is said to be voluntary, but utilized in a high proportion of troops. The Canadian Army injects tetanus toxoid with

typhoid vaccine. In civil life there are many groups where it would seem to be indicated: farmers and their families, industrial workers, children in general who have a proclivity for sticking nails into their feet, and others who for one reason or another may run a chance of infection with *Clostridium tetani.*

Many articles on this subject have appeared in various journals in the past few years. An excellent review by E. P. Jordan and George Halperin will be found in Volume I, No. 2, of *War Medicine:* the March, 1941, issue. This, in particular, we recommend for orientation in the subject.

RECRUITING PUBLIC HEALTH PERSONNEL

WE have heard recently a number of speeches on public health and national defense, and all of them were poor. We have made a few, too, and these were even worse. It is not an easy subject to discuss, for if one is not careful there is a lack of realism, and platitudes and cliches creep in. Thus, one embarks upon the theme that "public health is the first line of defense," or that "health protection of the civilian population is just as important as that of the military." There is, of course, some truth in these statements, but that "first line of defense" concept necessitates a tricky two-way definition of the word defense; and, while it is obviously a military necessity to maintain the health and continuing production of workers engaged in war industries, it must be confessed that an epidemic of influenza producing disabilities in a city would not be nearly so detrimental in time of war as it would if it caused a similar proportion of noneffectives in a tank corps or in a battleship. This is not to depreciate the importance of civilian health, but rather to emphasize to public health workers that the needs of the military, in personnel as well as in equipment, must come first. The United States of America is not just playing at war games; the boys in camp are not just tin soldiers; and student pilots in aviation are not playboys. This is the real thing, and it would seem that the sooner we in public health work and, incidentally, others, stop labeling everything "national defense," the better. There is only one first line of defense and that is the armed forces. Other things are of course important, even essential, but they must be secondary to meeting the immediate and continuing needs of those who are to repel and defeat an enemy.

All of this is preliminary to discussing the problem of recruiting public health personnel in the circumstances which exist. Common sense indicates that in this connection public health administrators might just as well make up their minds to an adjustment. We can use persons with minor physical disabilities, the Army and Navy Medical Corps cannot. If an individual possesses the necessary basic professional training and a reasonably good mind, it does not greatly matter to us, temporarily, that he has a fixed or movable bridge or a full set of false teeth, as long as he doesn't click them at people. A mild kyphosis, a squint, or somewhat flat feet need not necessarily make one unfit for certain phases of public health work, and a sanitary engineer of forty or a doctor even of fifty could be of some use. Women physicians, heretofore utilized only in a restricted manner in public health work, might well fill many of the positions previously occupied by men.

It would seem, therefore, that there are still sources from which public health may draw recruits. The only barrier now to be hurdled appears to be a psychological one. Public health administrators have, as a habit, looked to the robust and fairly recent graduates in medicine, engineering, nursing, etc., as the group from which new appointees would come. Because this stream is now diverted,

many state and city health officers seem inclined to throw up their hands and say there is nobody left to employ. Probably they will get over this as the pressure of staff vacancies becomes more acute, and will turn to these other sources. If this is so, might it not be wiser to meet the situation by carefully revised plans than to have these vacancies filled, and filled they will be, in a sort of hit or miss manner? The latter method would inevitably draw less desirable personnel than would be the case if foresight is exercised.

This new personnel is, and increasingly will be, badly needed, for even though one must be realistic and admit prior claims of the military, this does not lessen the necessity for maintenance of the health of the civilian population. But in shifting the search for recruits to a field not in competition with the Medical Corps of the Army and Navy, we must recognize a real danger that standards of competence may be lowered. Not only that, but there is the problem of civil service qualifications. Some state and city health departments have spent years in getting civil service standards up to a high and commendable level. Others are just embarking on civil service ventures. Every effort must be made to conserve old progress and insure new gains in personnel requirements as they relate to the public health field. It would be extremely unfortunate if in attempting to meet present problems by adjusting requirements to age and physical condition, we should unwisely make concessions as to professional competence, for the latter, in the long run, would be detrimental. How public health administrators may best safeguard against this will vary in the individual states and cities. In some places the civil service commission might, in view of the national emergency, lengthen the probationary period or extend the length of time of temporary appointments. In any event, in recruiting new public health personnel, two things must be borne in mind. The first is that the regular sources of recruitment are no longer open, and, second, there is danger of lowered standards.

How to orient, train, or educate new appointees follows naturally on the problem of recruitment. But that is another story.

HEALTH ORGANIZATIONS AND THE TELEPHONE

ONE could not conduct a modern business, a practice of medicine, or a public health program without a telephone. Upon that much all will agree. But comparatively few of those who use this method of communication recognize that it has its drawbacks and possesses dangers of doing subtle damage, only belatedly recognizable as such. These potential liabilities are not an inherent part of the telephone itself, but arise rather because of the circumstances in which the telephone is utilized and as a result of the effect it has upon those who make and receive calls. Most of these disadvantages may be offset by a little forethought, and it therefore seems worth while to review them as they relate to health organizations.

The first circumstance entering into the situation is that talking to an unknown at a distance has a peculiar psychological effect upon some people. Thus Mr. Bigg, in making or receiving a call to or from a stranger, cannot visualize, as a personality, Mr. Waite who is on the other end of the wire. Now any inclination that Mr. Bigg has to be perfunctory, or sour, or pompous, or a bully, is likely to come into full flower, for his personality for the time being has no opposition. Until his auditory apparatus and receptive centers register the implications of the name, position, and voice of Mr. Waite, Bigg is in his own

mind completely master of the situation; and possessing any of the characteristics just mentioned is likely to treat Waite as a nonentity. This, of course, does not please the latter, who is perhaps going through the same mental processes. The outcome of the conversation in such circumstances is unsatisfactory. Most people who occupy responsible positions have learned to curb these undesirable personality traits, but health agencies must remember that in most incoming calls, and in too many outgoing ones, it is the voice of a subordinate which represents the organization.

A second thing which has entered into telephone usage is having one's secretary make the call. The secretary, quite aware of who pays her salary, wants to please her employer. She therefore gets Mr. Waite on the telephone and then tells him that Mr. Bigg wants to speak with him. Mr. Bigg by this time may be on another telephone, or getting a drink of water or something. Mr. Waite for his part has to hold everything until Mr. Bigg comes to the 'phone. We speak almost bitterly on this matter, because invariably we have occupied the position of Mr. Waite: we have had to wait for Mr. Bigg, which has made us fume and wonder who the devil Bigg thinks he is. Naturally, it would be all right for the President of the United States to have most anyone wait for him to come to the telephone. It would be quite proper, too, for an executive to have his own subordinates do the same, but it would be unwise, to say the least, for a health officer, via his secretary, to telephone to the Mayor and keep His Honor waiting. It would seem that the least Mr. Bigg can do is to be ready to speak to Mr. Waite when the latter is put on the 'phone. Common courtesy indicates this in all affairs. In health organizations, common sense and tact demand it, unless, of course, Bigg wishes to emphasize to Waite that he considers him a person of no importance.

Many health organizations, in an effort to be businesslike and efficient, have eliminated "hello" on answering the telephone, which probably is wise. Usually on raising the receiver the name of the organization is given, say as "Western Health District." Now, when one considers the possible permutations and combinations of pronunciation, enunciation, rhythm, inflection, word emphasis, and tonal qualities, to say nothing of variations in speed and loudness of voice, it is apparent that the salutation "Western Health District" may carry to the listener anything from cordiality to insult. What it usually conveys is an impression of boredom and perfunctoriness. The person who first answers the telephone in a health organization does, therefore, occupy a position of importance, a sort of public relations ambassador without portfolio, and should be selected with this in mind and trained to become an asset.

This telephone business may seem a small thing in its relation to public health, and we wonder if we are justified in using editorial space for it. But here it is, for what it is worth.

Credit Lines

A Selective Digest of Diversified Health Interests

D. B. Armstrong, M.D., and John Lentz, M.S.

IN THE OFFING

A preview of the program for the Eighth Institute on Public Health Education causes us to look forward to October 12, 13, and 14 with unbounded interest. Those are the days on which the Institute will be in progress in Atlantic City, N. J., and we believe that you should turn to your desk calendar now and mark those dates as follows: "Away from office for Health Education Institute." The program abounds with items of varied interest, and no health worker could spend three days of his time more profitably than in attendance at this Institute where health education will be discussed, appraised, evaluated, and criticised by a veritable "who's who" of the profession, aided and abetted by the "up and coming" who are always given a voice in the discussion or clinic proceedings.

As in previous years, the Institute program will be highlighted with speakers who can be counted upon to give the audience something new and stimulating and practical. Dr. Ira V. Hiscock and his Institute Committee are to be congratulated on this year's Institute fare which will certainly whet the appetite of every health educator when the program is released.

We note that exhibits are to receive considerable attention at the forthcoming Institute. This phase of the program should be unusually profitable, for there is no medium of health education that needs searching analysis so much as the exhibit. With such authorities as Gebhard, Calver, Kleinschmidt, and Schmuck leading the exhibit discussions, much progress should be made toward clarifying the entire exhibit issue.

Everyone in public health will find items of interest on the program. We hope you will be among those present when the curtain goes up on the Eighth Institute on Public Health Education, Atlantic City, N. J., October 12, 13, and 14.

FORTUNE LOOKS AT THE U.S.P.H.S.

A well deserved tribute was paid the U. S. Public Health Service and its staff in the May, 1941, issue of *Fortune Magazine*. Two separate articles appeared in the publication—one on the history, activities, and the aims of the nation's great health agency, and another on the life story of one of the Service's "career men," a typical health officer. The appearance of these articles marks one of the few times that *Fortune* has devoted space to subjects of this nature. These articles on the Public Health Service will reach an influential audience, as *Fortune* is a magazine with a wide circulation among leading business executives. We congratulate *Fortune* on bringing this intimate view of the U.S.P.H.S. at work to a group of

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readers that perhaps has had little opportunity to become acquainted with one of the nation's most vital services.

The *Fortune* articles state that the entire force of the Public Health Service is performing what is probably "the most heroic job in the United States today." Moreover, the article adds, the task is being done by men and women whose pay is far from glamorous, though regular. Workers in the Service take their monetary rewards philosophically — "One needs money for food, for shelter, and for health; beyond that happiness comes from life itself."

The magazine stresses the fact that public health is the nation's No. 1 national resource—the motive power of everything: farming, industry, the army.

Increased realization of what health means to the nation has been brought about by our defense needs, according to *Fortune*. The magazine points out that: "Now for the first time we are beginning to see in health something positive, a resource to be developed to the last full measure. In the dim past the health precept was: eliminate the sick; then it became: cure the sick; then: don't get sick; and now it is: be healthier. This last is precisely what the U.S.P.H.S. means when it preaches that health is part of life, liberty, and the pursuit of happiness."

The *Fortune* article dealing with the career of a health officer creates a very definite impression in the mind of the reader—namely, that our country has no more loyal and devoted public servants than its health officers. It is inspiring to read of the work that the health officer accomplishes despite the ignorance, fear, and negligence that he encounters in many places where his work takes him. All of which brings to mind the fact that as yet there has been no popular book on the health officer. The public has had a plentitude of books telling the interesting life stories of physicians, surgeons, lawyers, ministers, and editors; but the health officer remains unsung. We hope some writer will soon tap this rich source of story material. Until a book on the health officer comes along, read the *Fortune* articles. They come as near as anything we know to giving a true appraisal of the services rendered by the country's health workers.

PUBLICATIONS AND POSTERS

Health educators, teachers, school administrators, parents, and others who are largely responsible for children's mental health will find a valuable and authoritative guide in a publication issued by the American Medical Association under the title, "Mental Hygiene in the Classroom." The excellent material in this publication stems from a report of the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association, with the cooperation of the National Committee for Mental Hygiene and the American Orthopsychiatric Association. Situations derived from case histories are presented and the reader is asked to select from three possible procedures the best method for dealing with the problems involved. These case studies make clear to the reader the application of mental hygiene principles to ordinary situations which teachers are likely to face every day in their classrooms. In the discussion of these situations, the booklet frequently recommends a good physical examination as a starting point for the solution of the child's difficulties. Daily health habits in relation to behavior problems are also considered throughout the publication. Furthermore, the booklet recognizes that the development of good mental health habits is far more important in the education of children than the acquisitions of skills such as reading, writing, and arithmetic. Also reported in this publication is the fact

that many schools are dropping the old system of marking, as they believe education should be planned to fit the capabilities and needs of children. This helpful and well organized publication may be obtained, at *20 cents* per copy, from the Bureau of Health and Public Instruction, American Medical Association, 535 North Dearborn Street, Chicago, Ill.

Two new publications and two new posters on syphilis have recently been made available. One of the publications entitled "The Doctor Says . . ." comes from the U. S. Public Health Service and relates in an informal conversational style the information that a physician might give to a young couple seeking blood tests. It is a convincing presentation and could be used to dispel opposition that health officers might encounter in localities where pre-marital blood tests have been questioned by those unfamiliar with or misinformed regarding the purpose of the procedure.

"How Many People Have Syphilis?" is the title of a reprint that the American Social Hygiene Association is distributing in an effort to clarify the question of the prevalence of this disease. Widely differing estimates have been given as to how many people have syphilis, and a brief and authoritative report on the subject has long been needed. This reprint, which health officials should call to the attention of newspapers and other publicity media, is available from the association.

Those who have been calling for health posters executed according to modernistic technics will perhaps find all that they have wished for in two posters on syphilis which the U. S. Public Health Service recently produced. The blood tests for syphilis and congenital syphilis are the subjects which the new posters publicize. Both are striking examples of modern poster art in which unusual layouts and effective color combinations are utilized. While we favor discarding all moss-backed technics in health education materials, we do feel that the blood test poster may be a bit too modernistic, too "arty," too Grecian in its conception for the audience which it endeavors to reach. Let's make use of every new idea or technic possible in posters and other publicity media, but at the same time let us not lose sight of the fact that the greater part of the audience which will see these posters is not yet "educated" to modern art conceptions and consequently the more conventional type of illustration may be more effective in putting over a message. The slogan on the blood test poster—"Know for Sure — Get a Blood Test for Syphilis"—meets all the requirements of a good slogan: it is brief, explicit, to the point, and easily remembered. The Public Health Service has done an outstanding job in the preparation of its educational materials on syphilis and gonorrhea.

MORE ABOUT REPORTS

Since the first of the year every issue of "Credit Lines" has contained references to the yearly reports of health agencies. If you are becoming somewhat allergic to reading comments on the subject, we can hardly blame you. Nevertheless, as long as outstanding examples of annual reports reach us we feel that they should be given due recognition in this section of the JOURNAL.

Regardless of the wordage that has been devoted to the subject to date, space would have to be found for comments on such a report as that of the Westchester County Health Department, White Plains, N. Y. "Forward to Health" is the appropriate title of this report which recounts the work of the department from 1930 to 1940. It is a handsome publication, spirally bound, and profusely illustrated with

photographs, line drawings, and pictorial charts. The typography, the layout of the pages, and the excellence of the art work all contribute to make this report an "optically pleasing publication," as *Time Magazine* might say. The 71 pages of this report present a vivid picture of the work accomplished by the Westchester County Health Department and it is, indeed, a record of which the entire staff of the department and the community which it serves can be proud. The foreword to this report, written by Dr. George H. Ramsey, the Health Officer, summarizes in a picturesque way, a concept of public health work which is so effectively expressed that it deserves quoting:

> Gentle fingers of a nurse show a new mother how to care for her baby, and another citizen will grow up without the ills that recently were common in childhood. Nimble fingers of a white-clad physician guide the needle that pricks lightly into a boy's arm, and another child has been saved from smallpox. Trained fingers apply their test-tube learning to specimens of milk and of water, and disease is tracked down before it can do its harm. Busy fingers play a symphony on typewriters and coding machines, and the ailments of a county's residents are recorded in a central office to steer public health workers in the fight against disease.
>
> This is the work of public health, an art that organizes the efforts of individuals trained in many specialties into one cohesive program for longer and better lives.

"Forward to Health" is a capably wrought report in all respects and one which we wish every health worker might see—especially those upon whom the job of preparing annual reports falls.

A simple, inexpensive report graced by an attractive title—such is the annual report of the Pasadena Health Department, Pasadena, Calif. "Health Happenings—1940" is the wording that appears on the cover. This seems to us a particularly intriguing and interest arousing title. The report is well written, attractively illustrated, and has a table of contents that is a clever combination of statistical information and page references.

Would you believe that an appealing annual report could be presented on a single folded page of standard letter size? "It can't be done" is probably the answer that most people would give to this question. Yet, the District Nursing Association of Portland, Me., has "turned the trick." And, moreover, room was found in the make-up of this report for an imaginative and original presentation of the nurse's rôle in the community. Three illustrations appear in connection with the text—one showing the head of a nurse, another the nurse's hands, and another the nurse's feet. Accompanying each illustration is the following text: Her head is trained to instruct in matters of health . . . Her hands give skilled nursing service to those ill in their homes . . . Her feet travel 5,000 miles a year to do bedside nursing and give maternity care. This simple report must be seen to be appreciated.

An impressive account of the activities of the Georgia Warm Springs Foundation is revealed in its report for 1940. The Honorable Franklin D. Roosevelt, in the foreword, voices the hope that the Foundation will be able to devote more of its time to the broader aspects of the aftereffects of infantile paralysis for the benefit of all afflicted by the disease. The President also emphasizes the fact that the existence of the Foundation has aroused to an unbelievable extent in this country, and even abroad, a public recognition of the havoc caused by infantile paralysis and the necessity of making every effort to bring it under control.

The National Foundation for Infantile Paralysis, whose work is closely allied with that of the Warm Springs Foundation, is performing many valuable services to medical science and

public health. In the first place, it is effectively coördinating hitherto dissociated research activities having to do not only with infantile paralysis but with virus disease in general. In this respect, it has brought a reasonable degree of order into what was previously a chaotic condition. Furthermore, the Foundation has admirably demonstrated how research funds can be controlled and utilized for the benefit of the people, subjected only to unprejudiced scientific guidance and restraint.

MEAT FOR MILLIONS

Under the above title, the New York State Trichinosis Commission has issued a comprehensive report on the problem of trichinosis in New York State. This report is based on a study that was undertaken by the Commission, of which State Senator Thomas C. Desmond is Chairman. George H. Ramsey, M.D., Commissioner, Westchester County Health Department, Westchester, N. Y., and Professor O. R. McCoy of the School of Medicine and Dentistry of the University of Rochester, Rochester, N. Y., are members. The Commission has recommended that three main lines of attack be used to combat the disease: (1) institute legislature measures to prevent the feeding of uncooked garbage to hogs; (2) establish a state meat inspection service; and (3) investigate the possibility of a trichinosis skin test for hogs.

The report covers in an exhaustive manner all phases of the trichinosis problem, including control measures and prevalence, with recommendations relative to the feeding of hogs, the handling of pork products, meat inspection, and housewife education. The report also includes a section on tularemia.

The United States is said to have the largest trichinosis problem of any nation in the world—more than 21,000,000 Americans being infected. Here, then, is a problem for public health authorities to attack with all the resources at their command. The report of the New York State Trichinosis Commission should be helpful to health officials in localities where the disease is of major importance.

MAGAZINE ARTICLES

Current popular magazine articles on health or of medical import:

"Good Eyes for Everyone." Mary Halton, M.D. *Parents' Magazine*, March, 1941.

"Turning the Mind Inside Out." Waldemar Kaempffert. *Saturday Evening Post*, May 24, 1941.

"The Surgeon Follows the Bombs." Hannah Lees. *Colliers*, May 24, 1941.

"U. S. Public Health Service." *Fortune Magazine*, May, 1941.

"The Postman Always Looks Twice." N. L. Burnette, Sc.D. *Canadian Home Journal*, May, 1941.

"An Epoch-Making Cure for Gonorrhea." Paul de Kruif. *The Reader's Digest*, June, 1941.

"To Become a Great M.D. Begin at 14." Paul de Kruif. *The Reader's Digest*, June, 1941.

(The above is not presented as a complete list and the articles cited are not necessarily recommended.)

JOTTINGS

The efforts of health authorities to introduce modern medical and sanitary procedures in a remote Mexican village where disease and sickness were treated by natives who practised magic and herbology, are recounted in a new book by John Steinbeck entitled "The Forgotten Village" (The Viking Press—$2.50). This book pictures a dramatic clash between medicine and magic and shows what can be accomplished through health education among people whose manner of living is almost the same as it was a thousand years ago. . . . The National Nutrition Conference recently held in Washington, D. C., out-

lined a campaign of popular nutrition education that will bring into play all types of publicity media: the radio, the motion picture, the exhibit, lectures, publications, posters, etc. It appears that health education will be the spearhead of the campaign to induce Americans to eat their way to health. . . . We recently came across a definition of the word "appropriation" that will doubtless appeal to health officers: Appropriation—a body of money entirely surrounded by curtailment. . . . Health educators interested in improving their copy writing should procure a little book by Henry Justin Smith entitled "It's in the Way It's Written." It is full of sound advice for those who do any kind of publicity. The book may be secured from Louis Mariano, Chicago Daily News Building, 400 West Madison Street, Chicago, Ill., at *30 cents* per copy. . . . Health departments contemplating campaigns on infant mortality or planning to institute a series of health panels for the public should see two monographs on these subjects recently issued by the District Health Education Demonstration, Department of Health, New York, N. Y. These monographs contain all the "ammunition" necessary to the successful conduct of such activities. . . . Did you miss Dr. Norman C. Wetzel's article in the March 22 issue of the *Journal of the American Medical Association* entitled "Physical Fitness in Terms of Physique, Development, and Basal Metabolism with a Guide to Individual Progress from Infancy to Maturity"? It should be placed on your list of useful references. . . . Quotation of the month: "I am a firm believer in the theory that you can do or be anything that you wish in this world, within reason, if you are prepared to make sacrifices, think, and work hard enough and long enough." (*Sir Frederick Banting*)

BOOKS AND REPORTS

Studies in American Demography —*By Walter F. Willcox. Ithaca: Cornell University Press,* 1940. 556 pp. Price, $4.50.

This interesting book summarizes the publications of a man who has labored in the field of vital statistics for about 50 years; one who during most of his career was compelled to work with meager statistical raw material of indifferent quality—not that the quality is always too good today! In some ways, therefore, the book calls to mind the old family doctor, who was shy on modern technical gimcracks, but who did make the most of close observation and common sense.

The first of the three main sections of the book deals with studies in American census statistics. The twelve chapters in this section include such subjects as statistical tests of progress, world population, longevity, development of the American census, and the statistical aspects of population density, sex, race, age, literacy, and marital condition.

The second section deals with American registration statistics, with 7 chapters on the development of registration, birth rates and substitutes for it, standardization, alleged increase of cancer, divorce, and immigration.

The third section devoted to miscellaneous studies touches statistical aids to courts, measuring public opinion, history of statistical societies, and biographical sketches of John Graunt, Lemuel Shattuck, and John S. Billings.

An appendix gives 10 pages of definitions of statistics and demography, a discussion of the population of China, and the author's own bibliography of roughly 120 titles.

Among the more important contributions of the book are the author's own observations of the development of the Bureau of the Census and of the American registration system, with both of which he had long and intimate association. His discussions of under reporting should make wholesome reading for the young statistician.

His use of the fertility index (population under 5 per 1,000 women age 15–44) in place of the birth rate is an example of the ingenious use of substitutes; likewise his use of the ratio of rural to urban mortality as a rough measure of the completeness of death reporting. Rather wistfully, he wishes he could have had longer use of statistics derived from birth registrations, post card and other samples and the other recent developments.

Willcox points out that he is no mathematician. This reviewer recalls not a single formula in the book, and such processes as standardization are explained in detail as text.

Most of the statistics terminate with 1930.

To the student of the history of demography, this book should prove valuable and interesting.

A. W. HEDRICH

Social and Economic Aspects of Swedish Population Movements, 1750–1933 — *By Dorothy Swane Thomas. New York: Macmillan,* 1941. 487 pp. Price, $6.00.

The chief feature of this study of population movements is the analysis of the source and destination of migrants by type of community. The basis for the classification of communities is the degree of industrialization

and urbanization. Thus communities are ranked beginning with those which are almost wholly agricultural and ending with Stockholm, the metropolis of the nation.

As a background for this study of migration Dr. Thomas has sketched briefly but clearly the development of Sweden's population since 1750 and the chief features of its agricultural and industrial development during this period. She has also shown how the economic and social development of the country is related to the changes in the numbers and the composition of the population. Her brief introductory statement of the importance of knowing the composition of a people in order to understand its social and economic development is excellent.

The study of migration shows, as would be anticipated, that the net movement of migrants is from the more rural areas to the more industrialized and urban areas. But it also shows that this net movement is only a small part of the total movement. This is a feature of migration, and particularly of internal migration, which has not been generally realized, nor has its social significance been much appreciated.

It is to be regretted that the lack of data makes it impossible to pursue similar studies of migration in this country. WARREN S. THOMPSON

Child Care and Training—*By Marion L. Faegre and John E. Anderson.* (5th ed. rev.) *Minneapolis: University of Minnesota Press,* 1940. 320 pp. Price, $2.50.

The widespread use of the above book, published originally in 1928, is testimony to its excellence. Now in its fifth edition, it is recommended highly in health, welfare, and educational journals. In each new edition the authors have checked and rechecked the previous edition, bringing the material up to date.

One of the outstanding features of the book is the "preventive" program presented, which is in line with the note of prevention found in progressive medical circles. It has a psychologically sound philosophy presented in a straightforward manner, and is charmingly illustrated with photographs of children. At the end of each chapter is a list of references, and also an excellent comprehensive bibliography is to be found at the end of the book.

As to contents, the book treats of the child from one year of age through college, under such subjects as the following: physical growth and development, including diet, clothing, and diseases; mental, emotional, and social growth, including early habit formation; constructive discipline, children's questions, etc. The last chapter deals with the most potent factor in the child's life—the family

The authors are recognized authorities on the subject of child care and training. Both have had long experience working with students in the classroom and with parents. They themselves are parents, which has given them close, firsthand experience in their own family laboratories.

ETHEL GORDON

Growing Out of Babyhood—*By William S. and Lena K. Sadler. New York: Funk & Wagnalls,* 1940. Price, $2.50.

The above book by the Drs. Sadler is one of many published by them in more than thirty years of practice as physicians and psychiatrists. Their long experience with family problems has well fitted them to deal with this subject. Case examples from their own experiences help to point up their discussions. This particular book is intended as a guide book, especially for parents, as well as for all adults faced with specific problems of the preschool age child. The authors felt that there

was a wealth of material on the physical health of the young child, and so have devoted its pages to the "psychologic, psychiatric, emotional and social problems," of this age.

The first chapter deals with the normal child. Succeeding chapters throughout the book treat of problems in relation to the following: eliminative habits; thumb-sucking and nail-biting; temper tantrums; feeding and sleeping; obedience, discipline and punishment; play, imagination and falsification; sex problems; group adjustment; parent-child relationships. ETHEL GORDON

Dental Health Education and Dental Health Service in Hawaii—*By Guy S. Millberry, D.D.S. Hawaii: Strong Foundation,* 1940. 185 pp.

A careful survey of the dental health program in Hawaii, sponsored by the Strong Foundation, provided material for this stimulating description of one of the outstanding programs in the United States. Following a brief history of the development, the work of the responsible agencies is considered. The Strong-Carter Dental Clinic of Honolulu, with its emphasis on the prevention of dental disease and the preservation of teeth, operates for children in quarters provided at Palama Settlement where limited service is also provided for adults. The Division of Dental Hygiene is organized under able leadership in the Territorial Department of Public Instruction. A system of self-supporting dental clinics has been developed in some of the intermediate and high schools and in rural districts. In 1939, the Legislature provided for a mobile dental unit for the various islands—a mandatory program in the process of development.

The report emphasizes: the valuable prevention work of the Strong-Carter Clinic; the unique law in American legislation which makes instruction in dental health compulsory in the elementary schools; laws which make it possible for eleemosynary and industrial corporations to provide dental care for their wards or employees by employing dentists or dental hygienists to render the service; the vital interest taken in the problem of dental caries; and the useful research done in the Islands.

Among suggestions offered are: (1) dental care should begin with the preschool child; (2) a uniform type of dental health record is important; (3) dental care should be provided for parochial and private school children as well as for those in public schools; (4) a dental health service program should be established on a subsidy basis or contributory plan on the plantations which are the largest employers of labor in the Islands (one subsidized program has been in successful operation for five years); (5) a laboratory for dental research would be helpful. This volume is a valuable contribution to the subject of dental health education and service. IRA V. HISCOCK

Applied Microbiology and Immunology for Nurses—*By Charles Frederick Bolduan, M. D., and Nils W. Bolduan, M.D. 8th ed. rev. Philadelphia: Saunders,* 1940. 288 pp. Price, $2.25.

Within this small book one finds a discussion of pathogenic bacteria, yeasts, molds, protozoa, rickettsia, viruses and "certain other microscopic animal parasites." The condensing of so large a subject into so small a space presents a difficult task for the authors and undoubtedly accounts for the occasional lack of explanatory detail.

The book is divided into three sections: Part I, General Microbiology, contains 17 chapters; Part II, Special Microbiology, consists of 31 chapters; and Part III, Practical Laboratory Exercises. The arrangement is at times incoherent. For instance in Part I the early chapters which deal with (1) his-

tory, (2) character of bacteria, (3) various methods of studying bacteria, (4) nomenclature, (5) viruses, (6) various destructive age agents, are followed by one on the counting of bacteria. In Part II, 25 chapters on pathogenic organisms are followed by Bacteriology of Milk, Fermented Milks, Bacteriology of Water, Animal Parasites, and Chemotherapy.

It is apparent that the authors appreciate the language difficulty which the subject presents. This may account for the frequent use of the word "germ." However, in the chapter on The Newer Nomenclature the classification of bacteria is reported in terms of changes. Since the beginning student would know neither the new nor the old, this makes difficult reading.

The book contains statements which would not be clear to the beginner. For instance on page 43: "Following the extensive studies of Ehrlich and Bordet in the field of immunity, a number of extremely delicate methods were developed for differentiating bacteria by means of immunity reactions, principally by the method known as 'agglutination.'" See also the discussion on bacteriophage on pages 56–57.

The introduction to the subject of quarantine is interesting, but the discussion of the regulations for each disease makes dull reading.

The book contains much useful and up-to-date information. If it is to be used as a text for student nurses it will need to be supplemented.

LAVERNE THOMPSON

Industrial Housing in Wartime—*Results of the Competition Organised by The Royal Institute of British Architects. 66 Portland Place, London W 1, England.*

The designs for building given in this booklet while providing primarily for the accommodations required during war, are capable of adaptation for use when peace comes. While the hostels were considered in many cases the best solution for single men and women, and particularly for boys and girls, under wartime conditions, there is also a demand during the war for accommodation of families of married workers who are being encouraged to move with the bread winner. In addition to designing flexible plans for houses suitable for both family and hostel accommodation and convertible, when peace arrives, for normal family occupation residences, those engaging in this competition were asked to make plans for adequate air raid protection.

In addition to the house plans, estate plans were submitted, and there is a selection of these included in the booklet. Also consideration has been given to protection to the community in the form of camouflage.

The book is authoritative, coming, as it does, from the highest authorities in England, and though designed for English conditions, contains a great deal of interest for us in this country.

MAZŸCK P. RAVENEL

Magic in a Bottle—*By Milton Silverman. New York: Macmillan,* 1941. 332 pp. Price, $2.50.

Anyone who has visited the medical historians in and around San Francisco will not be surprised that from their rich libraries and richer conversations has come a good popular history of pharmacology. But only when the author was both scientist and journalist, and when he admittedly was put on the trail he followed by as colorful and distinguished a pharmacologist and scholar as Chauncey Leake, could one expect a manuscript as unusual as this. Here are the stories of morphine, quinine, digitalis, cocaine, salvarsan, aspirin, the barbitals, vitamins, hormones and sulfanilamide told with historical accuracy, and in the setting of the economic,

political, social and scientific entanglements in which their discoveries were made or to which they led. Tales of the men who wittingly or unwittingly discovered the drugs are here, too—not in the usual biographical style but in a series of pictures which bring them to life as effectively as a "flash-back" in the movies tells its tale. And for the more earnest reader there is an excellent bibliography of source materials and a less satisfactory index.

LEONA BAUMGARTNER

Natural Resistance and Clinical Medicine—*By David Perla and Jessie Marmorston. New York: Little Brown,* 1941. 1344 pp. Price, $10.00.

This is a unique book which has no counterpart in the English literature. The authors have undertaken to bring together, in one volume, the manifold aspects of natural resistance and to interpret their bearing on the modes of infection and immunity. It is refreshing in our days of highly specialized immunochemistry to observe a deliberate return of interest to the fundamental problems of immunology with which this science began; moreover, by laying stress on the modern advances in concept as well as in methods of approach, the authors have been able to substitute a store of precise knowledge in place of scattered empirical observations of earlier days. As it stands, this book is truly a monument to David Perla and his wife, both of whom have been identified with pioneering research in this field.

The breadth of the treatment is in keeping with the scope of the phenomena of natural immunity. It includes a general discussion of genetics and constitutional factors in resistance to infectious diseases, as well as a thorough presentation of the experimental data on age- and sex-linked resistance. The rôle of the endocrine system, particularly the adrenal gland, in natural defense and the function of vitamins in conditioning the reaction of the host to microbial invasion and intoxication are analyzed with a rare lucidity. The discussion of the effect of climate on resistance contains a great many data of value to those engaged in the epidemiological study of infectious diseases. A scholarly analysis of the comparative importance of humoral and cellular mechanisms will interest especially the professional immunologist. While much of the material contained in this treatise is, of necessity, experimental in nature, the authors have not failed to emphasize wherever possible the practical measures of recognized value in preventive medicine. But the book, in spite of its title, will hardly satisfy those who expect a ready answer to purely clinical questions.

The book is admirably organized and reads smoothly. Each chapter has a summary which evaluates the available evidence conservatively and, in case of controversial issues, judiciously. Bibliography and index are exhaustive. *Natural Resistance and Clinical Medicine* can be heartily recommended to anyone with interest in the broader mechanisms of disease production, physician and laboratory worker alike.

C. W. JUNGEBLUT

Textbook of Clinical Pathology—*Edited by Roy R. Kracke and Francis P. Parker. (2d ed.) Baltimore: Williams & Wilkins,* 1940, 780 pp. Price, $6.00.

Fourteen clinical teachers, all specialists in their line, were chosen to write the material for this book under the able editing of Professors Kracke and Parker.

The theoretical background of all procedures is briefly, but clearly explained where germane to the subject. The material is brief, but explicit and ample. The material is not padded, and gives the whole clinical field of

practical laboratory procedures. Where clinical procedures are to be carried out, emphasis has been placed on the simplest practical one, instead of confusing the reader by a number of them.

The directions for cisterna puncture should be simplified. One cannot look at the forehead while working on the back of the neck. Its dangers have been over-stressed. Our internes do them frequently, but approach the operation with proper reverence.

The newer subarachnoid sacral puncture might well be included. It has a number of advantages in selected cases.

On the whole, the book is an invaluable addition to the library of the modern practising physician.

ALBERT G. BOWER

Mosquito Control: Practical Methods for Abatement of Disease Vectors and Pests—*By William Brodbeck Herms, Sc.D., and Harold Farnsworth Gray, Dr.P.H. New York: Commonwealth Fund. London: Humphrey Milford, Oxford University Press,* 1940. 317 pp. Price, $3.50.

This book is intended as a practical handbook on mosquito abatement. "It endeavors to present the fundamental principles of mosquito control, emphasizing practical application, geographic variation, and ecological differences in sufficient detail to indicate the main methods of attack on the problem."

After discussing the general principles of mosquito control and the economic loss from mosquitoes, the authors present illustrations of laws and agencies for mosquito abatement in various parts of the United States. They describe approved types of surveys and reports, together with the organization of abatement procedures and the education of the public.

Chapters are devoted to the finding of mosquito breeding places and the various methods of eliminating or controlling them; including drainage and reclamation of marshes; filling, pumping, and flushing; and the use of oils, chemical larvicides and fish. Protection against adult mosquitoes by means of screening, chemical repellents, and the killing and diverting of mosquitoes are discussed. The special features of mosquito control in urban and rural areas, and the subjects of species sanitation and naturalistic control are considered. A bibliography completes a well rounded presentation of the subject.

Although the authors draw mainly on their own experience on the Pacific Coast, they demonstrate a wide knowledge of the literature on methods employed elsewhere. The one important phase of mosquito control which the reviewer feels is not sufficiently emphasized is the use of concrete inverts in drainage ditches in order to increase their permanence and reduce the cost of maintenance. The usefulness of the book is increased by the inclusion of numerous tables, line-drawings and photographs. This book should be in the hands of everyone participating in malaria control work, and in the library of every institution where instruction in environmental sanitation is conducted.

HENRY E. MELENEY

Age Morphology of Primary Tubercles—*By Henry C. Sweany, M.D. Springfield, Ill.: Thomas,* 1941. 265 pp. Price, $5.00.

Infrequently there is published a new book on an old subject that is decidedly important either because the material is presented from a different point of view or because facts already established are reinterpreted and utilized to provide understanding of a complex and obscure biologic process. Dr. Sweany's monograph is important for both these reasons. It constitutes a well written and authoritative account of work that has been tedious and long, and presents rational and conservative interpreta-

tions of a heretofore largely neglected phase of the so-called primary tubercle of tuberculosis of human beings.

The book has as its objective the correlation of the relationship of the age of the tuberculous individual to morphologic characters of the primary lesion for the purpose of determining the duration or age of the infection. The volume is well illustrated by 73 photomicrographs and roentgenographs of excellent technical quality.

The book begins with a brief but interesting introductory essay on the thesis that most natural biologic processes appear to be regulated by definite although perhaps obscure laws and take place at regular intervals. Then follows the subject matter which is divided into two parts. Part one is concerned with the relationship of morphology to age of primary tubercles. This material is further divided into (1) material from patients in which contact with tuberculous infection began and ended before 7 years of age, (2) material from cases having an accurate history of contact at any time during life, and (3) age characteristics of presumably tuberculous extrapulmonary calcified lesions with special reference to those in the spleen. In part two is considered the practical application of the age-morphology principle established as a consequence to the data presented in part one.

The evolution of the primary tubercle as recounted in part one and the significance of the various cellular constituents that characterize this important entity from its inception to the end stage is a valuable account of important basic facts. While it is true as Sweany points out that the formation of the tubercle is one of the best understood phases of pathology, most of the knowledge gained has been by experimental methods. Dr. Sweany has projected and correlated this knowledge so that one can obtain a fairly definite concept of the situation as it obtains in human beings.

As to the practical significance of the findings, Dr. Sweany is commendably conservative. He writes "as with any innovation—too much should not be expected in the beginning." From the medico-legal aspect, the facts revealed on the age factor of the lesions of primary tuberculosis should be of assistance in fixing the time of exposure. It is also evident that the data contain information of prognostic value since lesions that are large in size and not calcified are potentially dangerous. Also of serious implications are the so-called soft lesions.

Dr. Sweany's observations and interpretations have demonstrated anew that wider horizons may be revealed by the morphologist with imagination and the will to accomplish a difficult task. His results attest to the importance and practicability of the morphologic approach to problems not only in tuberculosis but in other morbid conditions as well.

Taken in all, this book is a fine contribution to our knowledge of the pathology of tuberculosis. It represents a modern concept of the significance of morbid processes that have previously been seen and described by many, but interpreted and understood by few. The book is the product of a scholarly and well ordered scientific mind and should be read and re-read by pathologists, clinicians, and roentgenologists.

The book contains a comprehensive bibliography and an adequate index. The publisher has properly contributed his part in providing an easily read, well printed, and attractively bound volume.

WILLIAM H. FELDMAN

Psychotherapy—*By Lewellys F. Barker. New York: Appleton-Century,* 1940. 218 pp. Price, $2.00.

The growing appreciation that doctors must treat the patient as well as

the disease, is reflected in the frequency with which books like this, intended for the psychiatric orientation of the general practitioner, are appearing. From Dr. Barker's rich experience as an internist of rare competence, the doctor in general practice, whatever his limitations, will learn much of medical and psychological procedures for study and treatment. Defining psychotherapy as "treatment that attempts to improve the condition of a human being by means of influences that are brought to bear upon his mind," Dr. Barker takes up, successively, the making of comprehensive diagnoses, the planning of adequate treatment, the importance of heredity and environment, and the various methods of psychotherapy for organic and functional disorders available at various age levels. The exposition and interpretations are simple, terse, and very readable. A glossary of psychiatric terms, a well chosen bibliography and an index add to the value of this practical and helpful treatise.

PAUL O. KOMORA

America Organizes Medicine—*By Michael M. Davis. New York: Harper,* 1941. 335 pp. Price, $3.00.

It is refreshing to find a book on the organization of medicine which reviews the facts dispassionately. Michael M. Davis is a medical economist of recognized standing. Although he has sometimes been accused of special pleading, in this book certainly he has allowed the facts to do the pleading with little interference from the author. The book is distinguished in that it goes behind familiar slogans to discover their meaning. For example, instead of theorizing about "free choice of physician," it examines the ways in which patients actually choose their physicians today. The same approach is used toward the perplexing questions involved in paying for medical care, organizing professional services, providing care for the indigent, and extending the scope of public health.

The necessity for encouraging high professional standards and for guaranteeing the status of the physician is emphasized throughout, but the point is also made that the public has the right to participate in health planning. The author's suggestions are timely and realistic. His point of view is summarized in this passage: "The alternative ahead is not, on the one side, individual private practice and, on the other, regimentation of medical services. . . . The basic issue which modern society faces is not the survival of individualism, but *the maintenance of individuality within organization.*"[1]

Absorbingly written, this book is a most comprehensive and stimulating treatment of the problem of organizing for all health needs. It should be read by every health official and every physician who desires to keep abreast of what is happening in his profession. There are, of course, those shortcomings inherent in any work which attempts to present a broad subject briefly: much important detail cannot be included. The excellent bibliography to a large extent compensates for this.

DEAN A. CLARK

[1] Author's italics.

A History of Medicine *By Arturo Castiglioni. New York: Knopf,* 1941. 1013 pp. Price, $8.50.

Professor Castiglioni's *History of Medicine* has, among many qualities that commend it, this outstanding one: it presents the history of medicine against the broad background of man's cultural development. With but few exceptions, the medical histories that have been written to date have been either very scrupulous, minutely detailed, bulky compendiums of the lives and works of the hundreds of men who have "made" medical history, or else they have been brief, interpretative recita-

tions. But there has long been need for still another type of medical history.

This book admirably fills such a need. It is sufficiently detailed to serve as a reference source, and yet it is compact enough to allow the reader to "gather in the whole" without undue effort. It is also catholic in substance and spirit. Medical history cannot be studied or understood apart from the rest of human history. The growth of medical knowledge and the development of its practices are subject to influence by all the currents of human experiences; by religious faiths; by political and social contests; by industrial changes; by wars, famines and pestilences. To understand what has happened in medicine, one needs to know what has happened to mankind.

The author has the happy faculty of interweaving the threads of human history with those of medical history in such a wise that the whole forms a colorful tapestry, rich in deep perspectives. His catholicity is evident in another regard. He is sympathetic to his subject. He treats the periods and personalities of medical history with an understanding that transcends mere intellectual judgment. It has been a common but poor sport to decry and disparage certain periods in medical history, to point in the conceit of the superiority of our own age to the ignorance, superstition, and quackery that flourished *then*. This practice, worse than poor sport, is bad history. Castiglioni is without this fault, and for this renders a precious service to his reader. He does not gloss over what was faulty or false in the past. He rather sets the whole, good and bad, in the framework of the times. There is less frothy passion in such a presentation, but it makes for better understanding of the subject.

Because of its broad interest and tolerance Castiglioni's *History of Medicine* should prove particularly valuable to the public health worker, whether medically trained or otherwise. The reference framework to the medical event, the background representation of the important medical advances, are even greater prerequisites for the worker in public health than for the medical clinician.

Castiglioni is a brilliant writer. The translation from the Italian, made by Professor Krumbhaar, renders the crispness and luminosity of the original as faithfully as our more prosaic English will permit. The book is copiously illustrated. This work, then, is highly recommended to physicians and public health workers. IAGO GALDSTON

Publications of the University of Pennsylvania Bicentennial Conference—Medical Sciences: Problems and Trends in Psychiatry—*By Thomas M. Rivers, et al.* Price, 75¢. Therapeutic Advances in Psychiatry—*By Edward A. Strecker, et al.* Price, 50¢. Medical Problems of Old Age—*By Louis I. Dublin, et al.* Price, 50¢. Nutrition—*By Conrad A. Elvehjem, et al.* Price, 50¢. Female Sex Hormones—*By Edward A. Doisy, et al.* Price, 50¢. The Relation of Diseases in Lower Animals to Human Welfare—*By John R. Mohler, et al.* Price, 50¢. Modern Aspects of the Antituberculosis Program—*By J. Burns Amberson.* Price, 50¢. Chemotherapy—*By E. K. Marshall, Jr., et al.* Price, 50¢. A Challenge to Scholarship—*By W. Mansfield Clark.* Price, 50¢. *Philadelphia: University of Pennsylvania Press,* 1941.

One would have to be bold to attempt reviews of this group of essays. There are some 32 authors and the titles show the variety of subjects covered. That any one person could give an adequate review or express an opinion worth having on such a wide range of material is out of the question. The papers were all given during the Bicentennial Conference at the University of Pennsyl-

vania. The authors were selected as being specialists in the subjects which they have discussed.

Everyone knows that the advances in every field of medicine have been so varied and so tremendous that even the most expert finds it difficult to keep in touch with his own specialty.

The essays are mostly historical, telling what has been done, the present status of the subjects discussed, and, in some instances, hinting at the trends of research along the particular lines for the future. No paper carries any startling announcement of a discovery. All are made up practically entirely of material which has already reached the printed page.

We are tempted to mention particularly "A Challenge to Scholarship," by W. Mansfield Clark, which discusses the proper place of research in a university. This can be commended without hesitation to all engaged in or contemplating research, to university authorities, and especially to the heads of departments, in too many of which ". . . the encouragement of research has become a catchword. . . ."

There is no doubt that these essays have been well considered by those who are competent to judge of the many specialties with which they are concerned. The average reader will pick out a few for special study. There can be no question that they are authoritative, up to date, and written in good style, and as such are useful contributions to our knowledge.

MAZŸCK P. RAVENEL

Hutchison's Food and Dietetics—*By V. H. Mottram, M. A. and George Graham, M.D.* (9th ed.). *Baltimore: Williams & Wilkins,* 1940. 648 pp. Price, $6.75.

This book represents the 9th edition of the original work on dietetics written by Sir Robert Hutchison over 40 years ago. The introduction contains an interesting history of dietetics as written by Dr. Hutchison. The book is divided into 4 main divisions dealing with the principles of nutrition and dietetics, nature of foods, diet in infancy, and diet in disease.

The discussion on the principles of nutrition is developed in much the same manner as similar chapters in other texts on dietetics, although the chapter on energy is unusually well written. It is unfortunate that so little space is given to the trace elements and that only three members of the vitamin B complex, thiamin, riboflavin, and nicotinic acid, are discussed.

The chapters on the nature of food are excellent and contain information which should be given greater consideration by students of nutrition. It is interesting that much attention is given to the problem of infant feeding and the use of diet in treating specific disease, but even in this recent book on dietetics no space is devoted to a consideration of diet in advanced age.

C. A. ELVEHJEM

Your Community—*By Joanna C. Colcord. New York: Russell Sage Foundation,* 1941. 261 pp. Price, $.85.

This is the second edition of a popular volume discussing community organization, which was fully reviewed in the January 1940 issue of this JOURNAL. The new edition does not differ markedly from the first.

LEONA BAUMGARTNER

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

Killing Two Birds—Tetanus toxoid may be combined with diphtheria toxoid to produce immunity against both diseases.

BIGLER, J. A., and WERNER, M. Active Immunization Against Tetanus and Diphtheria in Infants and Children. J. A. M. A. 116, 21:2355 (May 24), 1941.

In Eight Per Cent It's the Teeth—Defective teeth, eye diseases, heart conditions are the top three among the causes for rejection of 2 out of every 5 men in the draft age. Though the rejections are higher this does not mean that the health of our young men is worse than in 1918. Undoubtedly it is better.

BRITTEN, R. H., and PERROTT, G. ST. J. Causes of Physical Disqualification Under the Selective Service Law. Early Indications. Pub. Health Rep. 56, 19:1017 (May 9), 1941.

Polio We Always Have with Us—Only four times since 1914 has the number of poliomyelitis cases exceeded the 1940 figure of 9,770. In the past year the disease was reported in epidemic form over large areas mostly in the north central part of the country. During the year the isolation of virus from stools was studied.

DAUER, C. C. Prevalence of Poliomyelitis in the United States in 1940. Pub. Health Rep. 56, 17:871 (Apr. 25), 1941.

They All Can't Be Right—In three comparable counties, the health departments showed striking differences in practice in the handling of communicable diseases, tuberculosis, maternal hygiene, and sanitary services. If such conspicuous differences are typical, they suggest the need for more critical evaluation of what we are trying to do.

DEAN, J. O., and FLOOK, E. How Health Departments Function with Respect to Specific Problems. Pub. Health Rep. 56, 18:929 (May 2), 1941.

Plain Enough for All To Grasp—Among 28,331 union members of the New York garment trades who were x-rayed, 1,102 cases of tuberculosis were discovered. Of the clinically significant cases, 53 per cent were in the minimal stage, and 37 per cent moderately advanced.

EDWARDS, H. R., *et al.* Tuberculosis Case-Finding. Am. Rev. Tuberc. 43, 4:491 (Apr.), 1941.

What Happens after Sanatorium Care?—Rehabilitation may become a potent factor in the further reduction of tuberculosis mortality. Hence it is important that survivor rates be known. Nearly 11,000 sanatorium "graduates" in Minnesota were followed up to get the reported statistics.

HILLEBOE, H. E. Post-Sanatorium Tuberculosis Survival Rates in Minnesota. Pub. Health Rep. 56, 17:871 (Apr. 25), 1941.

Statistics about Trichinosis—Of three thousand diaphragm examinations 16.3 per cent were found positive for trichinae. Most of the infestations were light. This incidence rate is believed to be typical. About 1.5 per cent had sufficient larvae to suggest that the persons must have suffered from clinical trichinosis at some time.

KERR, K. B., *et al.* Studies on Trichinosis. Pub. Health Rep. 56, 16:836 (Apr. 18), 1941.

Milk—Not much is new but the play upon words in the title, but there is plenty that is both sound and important about the production, handling,

and use of milk, and well worth repeating.

McHENRY, E. W. Milk: the Protected, Protective Food (and a dozen related papers in this symposium). Canad. Pub. Health J. 32, 4:143 (Apr.), 1941.

Says the Administrator of the Federal Security Agency—Industrial hygiene, medical and hospital care, and nutrition are the immediate health problems which must be tackled as our contribution to the national emergency.

McNUTT, P. V. Special Problems in Our Health Defenses. Pub. Health Rep. 56, 19: 988 (May 9), 1941.

Strep—That hemolytic streptococcal infections are important factors in rheumatic fever, is the guarded conclusion reached through this excellent series of reports of scientific research. But whether the streptococci are the only factors remains unanswered, and the mechanism responsible for the rheumatism remains unexplained.

MOTE, J. R., and JONES, T. D. Studies of Hemolytic Streptococcal Antibodies in Control Groups, Rheumatic Fever and Rheumatoid Arthritis. J. Immunol. 41, 1:35 (May), 1941.

Pneumonia and Serum—Alternate cases of pneumonia were treated with the sulfonamide drugs alone, and combined drug and homologous serum. The mortality was slightly higher among the cases given the combined therapy. The conclusion is that serum treatment appears to be indicated only for those persons who cannot tolerate the drugs, or who do not respond satisfactorily.

PLUMMER, N., *et al.* Chemotherapy Versus Combined Chemotherapy and Serum. J. A. M. A. 116, 21:2366 (May 24), 1941.

Where Tuberculosis Stands First in Cause of Death—Examinations for tuberculosis among women in industry, during pregnancy, after labor, and in many other categories should be continued. This is the conclusion of a study of tuberculosis incidence in various population groups.

PLUNKETT, R. E., and KATZ, J. Tuberculosis in Young Women. New York State J. Med. 41, 9:961 (May), 1941.

School Child Health—Despite the abandonment of the standard height-weight tables, children should be weighed monthly and growth curves plotted as a general index of nutritional status. Special methods, of course, should supplement this general appraisal.

ROBERTS, L. J. Practical Methods for Assessing Nutritional Status. J. Health & Phys. Educ. 12, 4:226 (Apr.), 1941.

A "Must" on Influenza—It is said that those who should know best are apprehensive about an epidemic of severe influenza during the coming season. It behooves us all, then, to be primed with the latest and best information about the prevention and treatment of the disease. You'll find just that in this excellent summary. Don't miss it.

SCUPHAM, G. W. The Therapy of Influenza. J. A. M. A. 116, 20:2264 (May 17), 1941.

Something to Try on Yourself—Suggested in the hope that it will be given a wide trial is this: for poison ivy dermatitis, rub off the top of the vesicles with alcohol-saturated gauze or clip off with scissors, and paint on a 10 per cent aqueous solution of tannic acid. After a half hour another application is made. The patient is instructed to apply the solution twice during the following day. New vesicles are treated as they appear.

SCHWARTZ, L., and WARREN, L. H. Tannic Acid Treatment of Poison Ivy (Rhus spp.) Dermatitis. Pub. Health Rep. 56, 20:1039 (May 16), 1941.

Many Don't Know They Have It—Sizing up the premarital blood test situation as it exists in about a quarter of the states across this wide country

the author concludes that the favorable results far outweigh the theoretical objections that have been advanced.

SHEPPE, W. M. The Evaluation of Premarital Legislation. J. A. M. A. 116, 18:2006 (May 3), 1941.

Scarlet Fever Immunization — Over a period of 4 years about 65 per cent of the grammar school children in two large counties were immunized with precipitated scarlatinal streptococcus toxin. Three graduated doses were given at 2 week intervals. The findings are too numerous and important to be abstracted here. Interested sanitarians will want to read the whole paper.

VELDEE, M. V., *et al.* The Dick Reaction and Scarlet Fever Morbidity Following Injections of a Purified and Tannic Acid Precipitated Erythrogenic Toxin. Pub. Health Rep. 56, 18:957 (May 2), 1941.

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TOUGHEN UP, AMERICA! By Victor G. Heiser. New York: McGraw-Hill, 1941. 228 pp. Price, $2.00.

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PROCEEDINGS OF THE FIRST AMERICAN CONGRESS ON OBSTETRICS AND GYNECOLOGY. Cleveland, Ohio, September 11–15, 1939. Fred L. Adair, Editor. Evanston: The Mumm Print Shop, 1941. 907 pp. Price, $5.00.

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FIRST AID IN EMERGENCIES. By Eldridge L. Eliason. 10th ed. Philadelphia: Lippincott, 1941. 260 pp. Price, $1.75.

YOUR TEETH. THEIR PAST, PRESENT, AND PROBABLE FUTURE. By Peter J. Brekhus. Minneapolis: Minnesota University Press, 1941. 255 pp. Price, $2.50.

PLAY FOR CONVALESCENT CHILDREN IN HOSPITALS AND AT HOME. By Anne Marie Smith. New York: Barnes, 1941. 133 pp. Price, $1.60.

OBSTETRICS FOR NURSES. By Joseph B. DeLee and Mabel C. Carmon. 12th ed. Philadelphia: Saunders, 1941. 651 pp. Price, $3.00.

AN OUTLINE FOR TEACHING OBSTETRICS TO NURSES. Planned for use with the 12th edition of Obstetrics for Nurses. Arranged in 30 lessons.

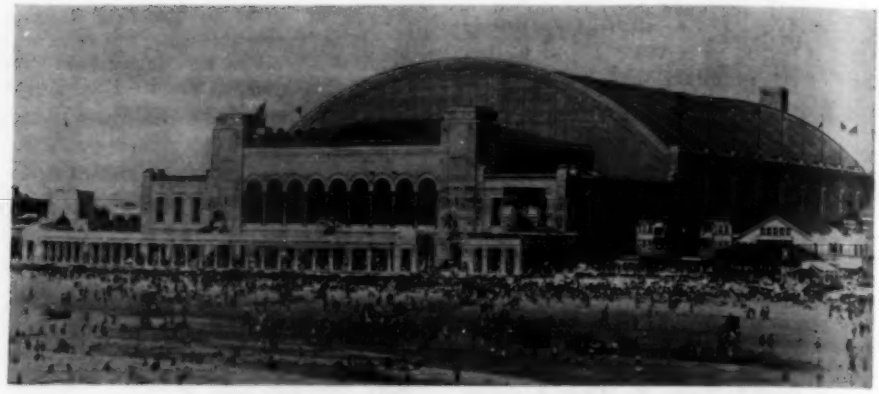
PUBLIC HEALTH AND HYGIENE. By Charles Frederick Bolduan and Nils W. Bolduan. 3d ed. Philadelphia: Saunders, 1941. 366 pp. Price, $3.00.

BIOLOGY OF THE LABORATORY MOUSE. By George D. Snell, Editor. Philadelphia: Blakiston, 1941. 497 pp. Price, $7.00.

MEAT FOR MILLIONS. Report of the New York State Trichinosis Commission. Albany: Fort Orange Press, 1941. 282 pp.

EDUCATION FOR FAMILY LIFE, NINETEENTH YEARBOOK, 1941. American Association of School Administrators. Washington: National Education Association, 1941. 368 pp. Price, $2.00.

ASSOCIATION NEWS



Convention Hall, Atlantic City, N. J.

The 70th Annual Meeting

Atlantic City, N. J.

October 14–17

"What's on the Program for the 70th Annual Meeting?" This question will be answered in full in the August JOURNAL. The General and Special Sessions, the Section meetings, the meetings of related organizations, and, of course, the Eighth Institute on Public Health Education, will be reported in detail, both as to subjects and speakers.

A panoramic view of how the health worker has spent his time in the last year, how he is spending it now, and the things that will engage his attention during the months ahead is presented by the Annual Meeting Program. It is deserving of study by all JOURNAL readers as an over-all picture of what the Section Secretaries and the Program Committee, representing all the interests of the Association, have selected from the broad field of modern public health as especially significant and important at this time.

The program of the Health Education Institute will be distributed by mail to the members of the Health Education Section before the August JOURNAL is off the press. It will be sent to all others on request. Its content is summarized on an announcement in the advertising pages of this issue.

The Committee on Scientific Exhibits will welcome applications for space for the exhibiting of technical work in progress by individuals or agencies, of results of research, of special activities of health departments and voluntary agencies, and of exhibits designed to educate the public. The Committee on Motion Pictures is assembling films for the motion picture program and invites suggestions from readers.

RAILROAD FARES FROM VARIOUS POINTS TO ATLANTIC CITY, N. J.

American Public Health Association
October 14–17, 1941

From	One-way for Pullman Travel	Round-trip for Pullman Travel	One-way Lower Berth	One-way Upper Berth
Atlanta, Ga.	$24.95	$39.70(2)	$6.60(8)	$5.15(8)
Baltimore, Md.	4.90	9.65(3)	2.65	1.80
Boston, Mass.	11.90	22.60(1)	3.20(8)	2.35(8)
Buffalo, N. Y.	14.30	27.20(3)	3.15	2.20
Chicago, Ill.	26.30	47.70(3)	6.30	4.35
Cleveland, O.	16.15	30.50(3)	3.95	2.70
Dallas, Tex.	46.79	72.40(3)	12.40(8)	9.55(8)
Denver, Col.	57.36	94.30(3)	13.95(8)	10.75(8)
Duluth, Minn.	39.97	68.25(3)	9.50(8)	7.35(8)
Fort Worth, Tex.	47.68	73.70(3)	12.40(8)	9.55(8)
Indianapolis, Ind.	23.35	42.85(3)	6.05	4.15
Jacksonville, Fla.	29.50	46.50(2)	7.90(8)	6.15(8)
Kansas City, Mo.	39.10	67.90(3)	9.45	7.20
Louisville, Ky.	25.15	45.80(3)	6.30	4.35
Los Angeles, Cal.	90.54	138.00(6)	22.60(8)	17.35(8)
Memphis, Tenn.	33.90	53.10(2)	8.95	6.80
Milwaukee, Wis.	28.85	51.55(3)	6.85(10)	4.90(10)
Minneapolis, Minn.	38.51	66.05(3)	8.95(8)	6.95(8)
Nashville, Tenn.	27.65	43.75(2)	7.10	5.40
New Orleans, La.	39.50	61.50(2)	10.00(8)	7.75(8)
New York, N. Y.	4.10	7.00(1)	.80(7)	
Omaha, Nebr.	41.21	70.15(3)	9.50(8)	7.35(8)
Philadelphia, Pa.	2.05	2.30(4) 2.55(5)	.55(7)	
Pittsburgh, Pa.	12.50	23.95(3)	3.15	2.20
Portland, Ore.	90.69	138.00(6)	22.60(8)	17.35(8)
Salt Lake City, Utah	71.09	107.05(6)	17.10(8)	13.15(8)
San Francisco, Cal.	90.54	138.00(6)	22.60(8)	17.35(8)
Seattle, Wash.	90.69	138.00(6)	22.60(8)	17.35(8)
St. Louis, Mo.	30.75	55.35(3)	7.65	5.25
Washington, D. C.	6.05	11.85(3)	2.65	1.80
Montreal, Que.	16.05	32.15(3)	3.70(8)	2.75(8)
Halifax, N. S.	34.70	63.80(1)	8.45(8)	6.35(8)
Ottawa, Ont.	18.35	36.85(3)	4.30(9)	3.35(9)
Quebec, P. Q.	20.65	40.55(3)	5.30(8)	3.80(8)
Toronto, Ont.	18.50	34.80(3)	3.70(8)	2.75(8)
Vancouver, B. C.	90.69	138.00(6)	22.60(8)	17.35(8)

NOTES: (1) 10 day limit (2) 30 day limit (3) 60 day limit (4) 2 day limit
(5) 4 day limit (6) 3 months limit (7) seat (8) berth to Philadelphia seat to Atlantic City
(9) seat to Montreal, berth to Philadelphia, seat to Atlantic City
(10) seat to Chicago, berth to Atlantic City

The A.P.H.A. Membership Nomination Blank

On page XXI of this issue of the *Journal* appears a form to be used by members of the A.P.H.A. in nominating other persons for membership. This blank will be carried in the next few issues and we hope that every member will use it at least once.

RATES QUOTED BY ATLANTIC CITY HOTELS

Seventieth Annual Meeting, October 14 to 17, 1941

AMERICAN PUBLIC HEALTH ASSOCIATION

ALL RATES QUOTED ARE FOR ROOMS WITH BATH ON EUROPEAN PLAN

(Rooms without Bath and Two Bedrooms with Bath Between Are Available in Some Hotels)

Boardwalk Hotels

Key No.	*Single Rooms with Bath*	*Double Rooms with Bath*
32 Ambassador ..	$3-$4-$5-$6	$6-$7-$8-$10
22 Brighton	$3-$4-$5	$5-$6-$7-$8
6-7 Chalfonte-Haddon Hall	$3-$4-$5-$6-$8	$6-$8-$10-$12
33 Chelsea	$3-$4-$5	$5-$6-$7-$8
28 Dennis	$3.50-$4-$5-$6	$6-$7-$8-$9-$10
14 Knickerbocker	$3-$3.50-$4	$5-$6-$7
11 New Belmont	$2.50-$3	$4-$5-$6-$7
34 President ...	$3	$5.50-$7-$8
31 Ritz - Carlton	$3-$3.50-$4-$5	$5-$6-$7-$8-$10
4 Seaside	$3-$3.50-$4	$5-$6-$7
29 Shelburne ...	$4-$5-$6-$8-$10	$6-$7-$8-$10-$12
21 Traymore ...		$8-$10-$12

All hotels offer Suites and DeLuxe Rooms. Rates can be ascertained by direct correspondence with the individual hotels.

Avenue Hotels

Key No.	*Single Rooms with Bath*	*Double Rooms with Bath*
30 Arlington ...	$3.50-$4	$5-$6
19 Byron		$4.50-$5-$5.50-$6
8 Colton Manor	$3-$3.50-$4-$5	$5-$6-$7-$8-$9
25 Crillon*		$5-$6
26 Eastbourne ..		$4.50-$5-$6
15 Flanders	$3-$4	$5
24 Glaslyn-Chatham		$5
17 Jefferson	$3-$3.50	$5-$6
18 Kentucky ...	$2.50	$4
9 Lafayette ...	$3-$3.50-$4	$5-$6-$7
20 Madison	$3-$3.50-$4	$5-$6-$7
16 Monticello ..		$5
3 Morton	$2.50-$3-$3.50-$4	$5-$6-$7
10 Penn-Atlantic	$3	$5
13 Princess	$2.50	$4
Runnymede..	$2.50-$3-$3.50-$4	$4-$5-$6-$7
12 Senator	$3-$3.50-$4	$5-$6-$7

* Breakfast Included

MORE than 1,000 reservations have already been made in the headquarters hotel—The Traymore—and other nearby hotels. Only double rooms at $8.00 and up remain in the Traymore. The lower priced accommodations in all hotels naturally go first. Reservations should be made promptly on the form printed below. Please send it to the Hotel Committee, 16 Central Pier, Atlantic City, N. J., and *not* to the Association office.

Between Convention Hall and the Traymore, the Boardwalk hotels where rooms are still available are the Shelburne and the Dennis. Beyond the Traymore, the Knickerbocker, Belmont, Chalfonte-Haddon Hall, and Seaside all offer excellent accommodations. Beyond Convention Hall, there are the Ritz-Carlton, Ambassador, and Chelsea Hotels. Do not overlook the Avenue hotels. Some are removed only a little distance from the Boardwalk, which to many people is no disadvantage.

.....**(Cut off on this line and mail to Mr. Morgan)**.....

APPLICATION FOR HOTEL ACCOMMODATIONS

American Public Health Association

In making application for hotel accommodations, it is necessary that at least three choices of hotels be indicated and that a reasonable range of rates desired be shown. Whenever possible, arrangements should be made for double occupancy of rooms; only a limited number of single rooms are available.

A. J. MORGAN, Chairman
HOTEL COMMITTEE
16 Central Pier,
Atlantic City, N. J.

.....19.....

Dear Sir:—Please make hotel reservations noted below:

Hotel ..... First Choice

Hotel ..... Second Choice

Hotel ..... Third Choice

.... Double Rooms with bath for .... persons. .....Rate desired $.... to $.... per day

.... Single Rooms with bath. .....Rate desired $.... to $.... per day

.... Suites—Parlor, ... Bedroom(s) with bath for .... persons. ....Rate desired $.... to $.... per day

Arriving October ....., hour ..... A.M. ..... P.M. Leaving .....

If the hotel of first choice is unable to accept the reservation, the HOTEL COMMITTEE will endeavor to comply with your second or third choice in the order named. You will receive direct confirmation from the hotel accepting the reservation when made.

Rooms will be occupied by:

Name	*Street Address*	*City*	*State*

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

J. A. Chabot, M.D., Ste-Angele, Roberval, P. Q., Canada, Medical Officer

Ray L. Drinkwater, M.D., 804 Republic Bldg., Denver, Colo., President, Colorado State Board of Health

William Levy, M.D., 339 Main St., Suffield, Conn., Health Officer

Victor Fernandez Manero, M.D., Avda. del Castillo No. 340, Lomas de Chapultepec, Mexico, D. F., Mexico, Chief, Federal Dept. of Public Health

Ballard Norwood, M.D., Williamsboro St., Oxford, N. C., Granville County Health Officer

Chalmers S. Pool, M.D., St. James Hospital Laboratory, Butte, Mont.

Oscar L. Rogers, M.D., Washington County Board of Health, Sandersville, Ga., Commissioner of Health

Archibald N. Senesac, M.D., Board of Health, New Bedford, Mass., Agent and Medical Officer

J. F. X. Stack, M.D., 212 Garden St., Hoboken, N. J., Health Commissioner

Albert F. Zipf, M.D., C.P.H., 2418 21st St., Bakersfield, Calif., Director of School Health, Kern County Health Dept.

Laboratory Section

Robert I. Bosman, M.S., Craney Island Laboratory, Box 1834, Norfolk, Va., Teacher, National Youth Administration and U. S. Public Health Service Training Program

Cooper Brougher, Jr., B.S., State Health Dept., Nashville, Tenn., Associate Director, Div. of Laboratories

Victor B. Buhler, M.D., General Hospital, Kansas City, Mo., Pathologist, Health Dept. Laboratories

Jean-Marc Desranleau, B.A., Ministry of Health, 89 Notre Dame East, Montreal, Que., Canada, Assistant Bacteriologist

George Gillman, 955 Roosevelt Bldg., Los Angeles, Calif., Director, Pacific Medical Laboratories

Angus M. Griffin, Ph.D., 1335 H. St., N.W., Washington, D. C., Teacher, George Washington Univ., School of Medicine

Charles J. Hartz, 7937 Cottage Grove Ave., Chicago, Ill., Medical Technician, Century Medical Laboratories

Samuel H. Hopper, Ph.D., Georgia School of Technology, Atlanta, Ga., Professor of Biology and Public Health

Ardel A. Janson, 636 Church St., Evanston, Ill., Director, North Shore Clinical Laboratory

Marvin F. Klang, M.S., 8070 Elgin Ave., Detroit, Mich., Senior Sanitary Chemist, Detroit Sewage Treatment Plant

Margaret S. LeConey, B.S., 2510 N. Robinson Ave., Oklahoma City, Okla., Consultant Laboratory Technician, Oklahoma State Health Dept.

William Ludwell Owen, Jr., M.S., 2524 North Boulevard, Baton Rouge, La., Director, The Wm. L. Owen Laboratory

Ruth P. Dow, M.D., C.M., D.P.H., 2019 Marlowe Ave., Montreal, P. Q., Canada, Bacteriologist, Alexandra Hospital

Truman S. Potter, M.D., 5748 Harper Ave., Chicago, Ill., Research Associate, Laboratory of Preventive Medicine, Univ. of Chicago

Mac. C. Sandler, 2016 Wilshire Blvd., Los Angeles, Calif., Medical Director, Wilshire Medical Laboratories

Paul P. Shuster, A.B., Alexandria Health Dept., Alexandria, Va., City Bacteriologist

Harry B. Tiedebohl, Ahepa National Sanatorium, Albuquerque, N. M., Technician in charge of X-ray and Laboratory

Lillian Van de Vere, Y.W.C.A., Ann St., Hartford, Conn., Microbiologist, State Dept. of Health

Evert Wallenfeldt, M.S., 2238 Hollister Ave., Madison, Wis., Extension Specialist in Diary Industry, Univ. of Wis.

Frederick R. Weedon, M.D., 304 Hall Ave., Jamestown, N. Y., Director, Jamestown Municipal Laboratory

Aimee Wilcox, 874 Union Ave., U.S.P.H.S., Memphis, Tenn., Assistant Technologist, Malaria Investigations, National Institute of Health

Vital Statistics Section

Ann Dillon, B.A., Tuberculosis Study, Franklin, Tenn., Senior Statistical Aide, State Dept. of Public Health

Engineering Section

Marvin K. Argenbright, A.B., 32 Kitson St.,

Weston, W. Va., Sanitarian, State Health Dept.

Monroe F. Brewer, B.S., 5049 Page Blvd., St. Louis, Mo., Dairy Plant Engineer, St. Louis Div. of Health

Leo P. Cabana, C.E., 4663 Lacombe Ave., Montreal, Que., Canada, Asst. Superintending Engineer, Dept. of Health

Luis P. Daple, C.E., Calle N 204, Vedado, Habana, Cuba, Engineer, Ministry of Sanitation

J. E. Norris, Augusta St., Indianola, Miss., County Sanitation Supervisor, Sunflower County Health Dept.

Louis S. Payton, C.E., Higginsville, Mo., District Public Health Engineer, State Board of Health

Roland W. Portman, Box 146, Las Animas, Colo., County Sanitarian, Otero-Bent Health Dist.

John W. Wright, B.S., R. F. D. 4, Boise, Ida., Junior Sanitarian, State Dept. of Public Health

Industrial Hygiene Section

Heinrich Brieger, M.D., Dr.P.H., 1452 North 53rd St., West Philadelphia, Pa., Associate in Preventive Medicine, Hahnemann Medical College

Barbara H. Caminita, B.S., 501 N. Lincoln St., Arlington, Va., Junior Bacteriologist, National Institute of Health

James L. McCartney, M.D., 113 West 18th St., New York, N. Y., Medical Director, Wm. R. Warner and Co., Inc.

Artemio Miranda, M.D., 55 Shattuck St., Boston, Mass., Student, Harvard School of Public Health

Miguel Vera, M.D., 1758–Hidalgo Pte, Monterrey, N. L., Mexico, Chief Physician, Cia. Minera de Penoles

Maternal and Child Health Section

Edwin R. Watson, M.D., Georgia Dept. of Public Health, Atlanta, Ga., Associate Director, Div. of Maternal and Child Health

Food and Nutrition Section

Inez M. Eckblad, A.M., 161 West Mountain, Fort Collins, Colo., Extension Nutritionist, Colorado State College

William H. Harrison, Ph.G., 901 Ashland Ave., Wilmette, Ill., Technical Adviser, Continental Can Co., Inc.

Francis J. Lenehan, Ph.G., 4278 25th St., San Francisco, Calif., Food and Drug Inspector, State Dept. of Health

Kevin G. Shea, Ph.D., 81 Church St., Chicopee Falls, Mass., Food and Dairy Consultant

A. Elizabeth Whitney, B.S., 628 Pleasant St., Room 213, New Bedford, Mass., Nutrition Director, Dairy Council of New Bedford

Public Health Education Section

Oliver E. Byrd, Ed.D., Box 3006, Stanford University, Calif., Associate Professor of Hygiene

Max L. Durfee, M.D., M.S.P.H., Iowa State Teachers College, Cedar Falls, Iowa, Director of Health Service

William E. Painter, A.M., R 6, Box 20, Sappington, Mo., Dairy Farm Inspector, City of St. Louis

Frederck W. Rotthoff, 605 Ross Ave., Wilkinsburg, Pa., Sanitarian, Borough of Wilkinsburg

John S. Shiff, B.S., State Dept. of Public Health, Capitol Bldg., Springfield, Ill., Assistant Supervisor of Health Education

Public Health Nursing Section

Ann Castellanos, R.N., Beans Bldg., Room 409, San Jose, Calif., Secretary and Coordinating Nurse, Santa Clara County Tuberculosis Assn.

Dorothy E. Collard, R.N., Latah County Health Unit, Moscow, Ida., Senior Staff Nurse, State Dept. of Public Health

Myrtle Y. Mullins, R.N., 147 Court Ave., Weston, W. Va., Public Health Nurse, State Health Dept.

Hattie T. Samples, 209 Pine St., Charleston, W. Va., Public Health Nurse, Clay County Health Dept.

Ruth M. Scott, B.S., 1098 W. Michigan St., Indianapolis, Ind., Consultant Nurse, State Board of Health

Eleanor Stockton, A.B., 724 Phelan Bldg., San Francisco, Calif., Director, James D. Phelan Foundation

Epidemiology Section

Anne M. Bahlke, M.D., M.P.H., State Dept. of Health, Albany, N. Y., Physician-in-Training

John N. Eisman, M.D., 1050 Barry Lane, Cincinnati, Ohio, Student, Johns Hopkins School of Hygiene and Public Health

Paul R. Slater, M.D., 606 Cedar St., Burlington, Iowa, Epidemiologist, Upper Mississippi River Basin Malaria Survey

Alton A. Smahl, M.D., 1775 Walton Ave., New York, N. Y., Medical Consultant, Bureau of Social Hygiene, Dept. of Health

Henry van Zile Hyde, M.D., Bureau of Pneumonia Control, State Office Bldg., Albany, N. Y., Acting Director

Harry Weiss, M.D., 1112 Park Ave., New York, N. Y., Practising Physician

Unaffiliated

Dr. Bruno Viana Castillo, 632 Church St., Ann Arbor, Mich., Student, Univ. of Michigan

Albert R. Cunningham, 130 Brown Ave., Turtle Creek, Pa., Sanitarian, State Dept. of Health

Peter J. A. Cusack, A.B., 530 East 88th St., New York, N. Y., Executive Secretary, National Foundation for Infantile Paralysis, Inc.

DECEASED MEMBERS

J. Roslyn Earp, Dr.P.H., Albany, N. Y., Elected Member 1923, Elected Fellow 1927

Anneke Kollewijn, Cortez, Colo., Elected Member 1939

Aurora S. Nelson, Hill City, Kansas, Elected Member 1939

Matthias Nicoll, Jr., M.D., Rye, N. Y., Elected Member 1917, Elected Fellow 1922

Edwin T. Ramsey, M.D., Clark, S. D., Elected Member 1920

CLOSING DATE FOR SUBMITTING FELLOWSHIP APPLICATIONS

MEMBERS who may be interested in applying for Fellowship in the A.P.H.A. are hereby advised that Fellowship applications should be received not later than August 1, to insure consideration at the 70th Annual Meeting.

EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Positions Available

Southern State Department of Health seeks physicians qualified by training and experience as County Health Officers or as Pediatricians. Write A.P.H.A. Box B.

Western State Department of Health will consider applications from physicians with experience and a degree in Public Health. Write A.P.H.A Box S.

Director of County Health Unit, large southern metropolitan area over 200,000, duties to include the direction of complete generalized program. Applicant must have M.D., M.P.H., with satisfactory experience in administration and technical phase of public health work. Salary dependent upon experience and training. Opportunity for advancement assured. Box W, A.P.H.A.

Sanitary Chemist for sewage laboratory in Eastern city. Salary $2,000. Graduate preferred. Write Box V, Employment Service, A.P.H.A.

Physician with public health training to serve as full-time county health officer in rural South Atlantic area. Salary $3,600 to $4,000. Write Box C, Employment Service, A.P.H.A.

County Public Health Nurses for New Mexico. Must have 4 months' post-graduate instruction under one of the recognized public health nursing courses and one year's experience. Must drive and have a car. Address inquiry to State Health Department, Santa Fe, New Mexico.

U. S. CIVIL SERVICE COMMISSION

The Commission has announced that applications will be received for positions as Senior Medical Officer ($4,600), Medical Officer ($3,800) and Associate Medical Officer ($3,200) for appointments in the Public Health Service, with the Food and Drug Administration, Veteran's Administration, and the Indian Service. Forms for application may be obtained from the U. S. Civil Service Commission, Washington.

The Commission also announces that applications may be filed for the positions of Public Health Nurse ($2,000) and Graduate Nurse, general staff duty ($1,800) in the Indian Field Service, including Alaska. Forms may be obtained from the U. S. Civil Service Commission, Washington.

Positions Wanted

ADMINISTRATIVE

A physician with M.P.H. from Johns Hopkins 1924, experienced as state director for communicable diseases, as county health officer, and as director of field training center will consider a responsible position with good income. **A483**

Physician, aged 39, excellent graduate training and experience in public health, specialized in tuberculosis and epidemiology, now employed, will consider position with salary of $4,500 or better. **A473**

Physician, aged 44, graduate of Rush Medical, completing work at Johns Hopkins for M.P.H. and experienced as director of rural unit, will consider opening. **A480**

Experienced physician, graduate University of Illinois, M.P.H. Johns Hopkins 1940, seeks administrative opening suitable to his proven ability. Excellent references. **A466**

Physician with M.P.H. from Johns Hopkins and 10 years' field experience in responsible position with leading state health department, will consider good opening. **A481**

Physician, graduate of University of Iowa, candidate for Dr.P.H. at Harvard, seeks good administrative position. **A476**

Physician, aged 40, M.D. University of Minnesota, C.P.H. and Dr.P.H. Johns Hopkins, experienced in epidemiology and venereal disease control, will consider interesting position. **A482**

Physician, specialist in maternal and child health. M.D. University of Kansas, M.P.H. Harvard. Excellent background in pediatric residencies, experience in municipal and county health work and as director of maternal and child health in state health departments. Desires position as director of a state program, as pediatrician, or in school or college health program. **A479**

Dentist, University of Pittsburgh,

D.D.S., M.P.H. University of Pennsylvania 1941, experienced in practice, wishes an administrative position in public health, preferably at state level. **M450**

HEALTH EDUCATION

Director of Health Education, woman. Knows fields of education and health education. National and state experience in organization, supervision, curriculum building, and teacher education. Now employed but would consider a change. **H495**

Young woman with Master's degree in Health Education, Teacher's College, Columbia University, and background of clinical laboratory work and biochemistry, seeks position as health educator in research or as laboratory assistant in public health. **H494**

Health educator with excellent background of teaching experience in schools. M.S.P.H. University of Michigan. Wishes position where skill with educational sound film projection and other recognized technics will be appreciated. **H405**

LABORATORY

Laboratory Director. Unusually well qualified and experienced man, aged 41, Ph.D. with training at Michigan, M.I.T., and Maryland, excellent references. Will consider administrative, teaching or research position in public health. **L459**

Experienced woman bacteriologist, now employed, graduate Iowa State College 1925, 6 months on Fellowship at Johns Hopkins 1930, wishes position in serology, bacteriology or research. **L458**

Experienced bacteriologist, young man of 33, Sc.B., who for several years has been in charge of state laboratory doing public health and diagnostic bacteriology, immunology, and serology, will consider opening. **L427**

SANITARY ENGINEERING

Engineer, aged 38, 3 years' experience as district sanitary supervisor, state department of health, together with work on plumbing, heating and ventilation, will consider position in the plumbing or heating field or state department of health. Prefers middle western or western states. **E453**

Engineer with good training and experience in water treatment, sewage plant operation, and in research, wishes position as superintendent. Can go anywhere. **E422**

STATISTICAL

Public Health Statistician. Young man, M.S.P.H. Michigan, now employed as supervisor of state health project, experienced in medical economic research, epidemiology studies and vital statistics, seeks position in city or state health department in midwest. **S458**

Advertisement

Opportunities Available

BACTERIOLOGISTS—Senior and junior bacteriologists for municipal health department laboratories; some experience public health laboratory procedures desirable, but not required; maximum entrance stipend; senior, $2,000; junior, $1,500. PH7-2, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

PUBLIC HEALTH PHYSICIANS—(a) For appointment as commissioner of maternal and child health; central state. (b) School physician; appointment under jurisdiction municipal board of health; city of 300,000; Midwest. (c) Venereal disease clinician; recent graduate interested but not necessarily trained, in venereal disease work preferred; about $3,200; East. (d) Rural health commissioner; public health training available to men interested but not trained in this field; South. (e) Public health physician, preferably with some clinical experience in tuberculosis work (particularly fluoroscopy); duties will include conducting well baby conferences, doing fluoroscopy in tuberculosis survey clinic, some communicable disease work; women physicians eligible; California. PH7-3, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

STUDENT HEALTH PHYSICIANS—(a) To head department in university averaging enrollment of over 1,000 students; man under 45 required; about $4,000. (b) For student health service of large north central university; fairly recent graduate eligible. (c) To organize and direct department of student health in eastern college for men; institution denominational, but not sectarian; Protestant required. (d) Two year fellowship in student health; recent graduate eligible; duties will include teaching, research; eastern university. PH7-4, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

PUBLIC HEALTH NURSES—(a) Educational director; well established community health organization in large metropolis; academic and public health nursing degrees required; salary range, $160–$250, depending upon qualifications. (b) For follow-up work in tuberculosis control program; $150; car and car maintenance provided; Pacific Coast. (c) County health nurse; $135–$150; West. (d) For newly organized community nursing service; initiative and organizing ability important; South. (e) School nurse; must be certified; retirement plan similar to that for teaching profession effective this fall; interesting opportunity. (f) To assume direction of outpatient department, fairly large hospital in New York State; must be eligible New York registration. PH7-5, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

Advertisement

OPPORTUNITIES AVAILABLE (*Cont.*)

BACTERIOLOGIST—Preferably physician, also familiar with public health work; duties will include teaching of medical bacteriology, immunology, and public health laboratory methods; qualifications must include ability to conduct independent research, record of contributions to scientific literature; university medical school; vicinity $4,000. PH7-1, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

Situations Wanted

PUBLIC HEALTH PHYSICIAN—Medical degree from midwestern school; M.S.P.H., University of Michigan; 2 years, assistant, state public health service. PH7-6, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

PUBLIC HEALTH NURSE—Graduate of eastern training school; B.S. degree in Public Health Nursing, Columbia; 10 years, director of nurses, public health nursing association; 5 years, field supervisor, large industrial company; 3 years, educational director and supervisor, visiting nurse association; available immediately. PH7-7, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

BACTERIOLOGIST—B.S., M.A., Ph.D., large university; splendid experience in teaching and research; 8 years, serologist, large hospital, metropolitan area. PH7-8, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

THE NEW YORK MEDICAL EXCHANGE

Public health physician, age 50, married, M.D. from McGill, C.P.H. and M.P.H. Johns Hopkins, licensed in Michigan, Illinois and British Colonial registration, past 14 years with a department of health in the midwest, will consider foreign or domestic appointment, salary desired at least $4,800. For further particulars, write Patricia Edgerly, Director, New York Medical Exchange, 489 Fifth Avenue, New York, N. Y.

NEWS FROM THE FIELD

TWELFTH ANNUAL MEETING OF THE WESTERN BRANCH, A.P.H.A.

SAN DIEGO was host to the 1941 meeting of the Western Branch and related groups, May 25–29. The Local Committee was under the Chairmanship of Dr. Alex M. Lesem, Health Officer of San Diego, and a full scientific program was arranged by a committee under the Chairmanship of James G. Stone of Los Angeles.

Although missing the customary participation from health workers in the Canadian provinces, the attendance from the 11 western states was excellent.

Preliminary conferences included those of state supervising nurses, persons in charge of maternal and child health and crippled children services, the sanitarians, the registrars and vital statisticians, and a meeting of the California State Board of Public Health was held during the sessions.

The program centered largely on the problems of public health in national defense. The keynote address was given by Dr. William P. Shepard of San Francisco, President of the Western Branch. Other papers covered housing, maternal and child health, venereal disease control, and sanitation, as they relate to defense. Reports were presented by several committees of the Western Branch, including the annual summary on sylvatic plague.

Dr. John J. Sippy of Stockton, Calif., became President of the Western Branch and Dr. Donald G. Evans, State Health Officer of Washington, was elected President-elect.

The following 1941–1942 officers were elected:

President—John J. Sippy, M.D., Stockton, Calif.
President-elect—Donald G. Evans, Seattle, Wash.
Vice-President—Lucille Perozzi, Portland, Ore.
Vice-President—L. J. Peterson, Boise, Ida.
Vice-President—W. W. White, Reno, Neva.
Secretary—W. F. Higby, San Francisco, Calif.
Treasurer—Guy S. Millberry, San Francisco, Calif.

Participants in the program from outside the territory of the Western Branch included:

Reginald M. Atwater, M.D., New York, N. Y.
Carl E. Buck, Dr.P.H., New York, N. Y.
Naomi Deutsch, Washington, D. C.
Margaret R. Harrison, New York, N. Y.
Benjamin G. Horning, M.D., New York, N. Y.
Pearl McIver, Washington, D. C.
Louis Schwartz, M.D., Bethesda, Md.
William F. Snow, M.D., New York, N. Y.
Fred Stimpert, Ph.D., Detroit, Mich.
W. H. Wright, Ph.D., Washington, D. C.

PUBLIC HEALTH ASSOCIATION OF NEW YORK CITY

THE Public Health Association of New York City held its Fifth Annual Meeting at Hotel George Washington in the Borough of Manhattan on May 22.

At the afternoon meeting, Thomas Duffield, Registrar of Records of the Department of Health of the City of New York, presented the statistical picture of mortality from diabetes, the heart diseases, cancer, and other leading causes of death in the city. Dr. Frederick W. Williams, a member of the Board of Directors of the New York Diabetes Association, described the public health aspects of that disease. Dr. J. Hamilton Crawford, Professor of Clinical Medicine of Long Island College Hospital, outlined the various problems in connection with the heart diseases. Dr. C. C. Little, Managing Director of the American Society for

the Control of Cancer, spoke of the public health, institutional, and clinical aspects of cancer.

At the Annual Dinner Meeting, Dr. Arthur I. Blau, President, presided. The speaker of the evening was Dr. Haven Emerson, Professor Emeritus of Public Health Practice of the DeLamar Institute of Public Health. Dr. Emerson took as his theme, "A Personal Credo of Public Health for New York City."

Dr. John L. Rice, Commissioner of Health of the City of New York, also spoke briefly.

The following officers were elected:

President—Arthur I. Blau, M.D.
Vice-Presidents—Helen C. Manzer, Ph.D., Alfred E. Shipley, M.D.
Secretary-Treasurer—Frank Kiernan.
Representative to the Governing Council of the A.P.H.A.—Frank Kiernan.

CORNELL RECEIVES GRANT

AN appropriation of $600,000 has been granted to Cornell University Medical College by the Rockefeller Foundation, for the endowment of the Department of Public Health and Preventive Medicine. The $600,000 fund in effect capitalizes an annual grant of $28,000 which the department has been receiving from the Rockefeller Foundation for the last 5 years. The endowment will enable the college to expand its public health teaching both for medical students and for personnel of the City Department of Health.

NEW OFFICERS OF THE NORTHERN CALIFORNIA PUBLIC HEALTH ASSOCIATION

AT a recent Annual Meeting the Northern California Public Health Association elected the following officers to serve for the year 1941:

President—Fred T. Foard, M.D., San Francisco
President-elect—John D. Fuller, M.D., Santa Cruz
Immediate Past President—I. O. Church, M.D., San Leandro
Vice-President—Dwight M. Bissell, M.D., Salinas
Secretary—Ann W. Haynes, San Francisco
Treasurer—Helen Hartley, Stockton
Representative on Governing Council of A.P.H.A.—I. O. Church, M.D.
Representative, Regional Board, Western Branch, A.P.H.A.—Nina Simmonds, Sc.D., San Francisco

NEW YORK HEALTH TEACHING SUPERVISORS

THE annual meeting of the Health Teaching Supervisors of New York State was held in Albany, N. Y., on May 7 and 8. At this time plans were completed for the organization of the New York State Council on Health Teaching.

The following officers were elected:

President—Mary Rappaport, Onondaga Health Association, Syracuse, N. Y.
Vice-President—Mary E. Bowen, Department of Education, Syracuse, N. Y.
Secretary-Treasurer—Iva B. Bennett, Baldwin High School, Baldwin, N. Y.

The President, Mary Rappaport, was asked to appoint a committee to draw up a constitution and by-laws for the Council. This report will be presented at the December meeting of the New York State Health and Physical Education Association, to be held in Syracuse.

ANNUAL MEETING OF MISSOURI PUBLIC HEALTH ASSOCIATION

THE 17th annual convention of the Missouri Public Health Association was held in St. Louis, Mo., May 15, 16, and 17, 1941.

The highlights of the meeting were addresses by Harry S. Mustard, M.D., J. J. Bloomfield, Halbert L. Dunn, M.D., and Ruth Kahl, R.N. Interesting sectional programs were provided for the health officers, sanitary engineers, public health nursing and vital statistic sections of the Association. A substantial increase in membership was reported.

The following officers were elected for the coming year:

President—James W. Chapman, M.D., Shelbina
First Vice-President—Abner Beard, Kirksville
Treasurer—Madge Proctor, Jefferson City
Secretary—Glen J. Hopkins, Jefferson City

MEETING OF GEORGIA PUBLIC HEALTH ASSOCIATION

AT its Annual Meeting held in Atlanta, May 29 to 31, the Georgia Public Health Association elected the following officers for the coming year:

President—J. E. Lester, M.D., Marietta
President-elect—E. J. Sunkes, Atlanta
Vice-President—Susie Turk, Toccoa
Secretary-Treasurer—Louva G. Lenert, Atlanta
Representative on A.P.H.A. Governing Council—Louva G. Lenert, Atlanta

NEW OFFICERS OF PENNSYLVANIA PUBLIC HEALTH ASSOCIATION

AT its Annual Meeting held at Wilkes-Barre on May 28, the Pennsylvania Public Health Association elected the following officers to serve for the coming year:

Honorary President—John J. Shaw, M.D., Harrisburg
President—Col. A. Parker Hitchens, M.D., Philadelphia
President-elect — Arthur M. Dewees, Philadelphia
Vice-President—Henry J. Benz, M.D., Pittsburgh
Executive Secretary-Treasurer—C. E. Houston, Washington

PERSONALS

Central States

CARLETON DEAN, M.D.,* has resigned as Deputy Health Commissioner and Director of local health service, Michigan State Department of Health, to become Medical Director of the Michigan Crippled Children's Commission in Detroit. Dr. Dean was for 9 years Health Officer of the district unit at Charlevoix.

CLAIRE E. FOLSOME, M.D., formerly Field Consultant in Obstetrics for the Michigan State Department of Health, has been appointed Executive Director of the Committee on Maternal Health, the name of which is now being changed to the Research Council on Human Reproduction, Inc. Dr. Folsome succeeds DR. RAYMOND R. SQUIER who returns to private practice.

WESLEY M. HALL, M.D., Rising Sun, Ind., has been appointed to succeed the late DR. GEORGE H. HANSELL as Health Commissioner of Ohio County.

EARL E. KLEINSCHMIDT, M.D.,* Associate Professor and Chairman of the Department of Public Health, Preventive Medicine and Bacteriology at Loyola University School of Medicine, has been granted leave of absence for 3 months to work in Washington making plans for the protection and guidance of students employed in vocational training for defense work in industry.

ELDRED V. THIEHOFF, M.D.,* of Detroit, Mich., has been appointed Acting Deputy Health Commissioner and Director of the Bureau of Local Health Service, Michigan State Department of Health, Lansing. Dr. Thiehoff was formerly Assistant Director in the Bureau of Local Health Services, working with county and district health departments.

Eastern States

MORTON H. CHAPNICK, M.D., has been appointed Health Officer of Thompson, Conn.

ROY C. FERGUSON, M.D., Rockville, Conn., has been appointed Health Officer of Vernon.

EDWARD J. FINN, M.D., has been appointed Health Officer of Shelton, Conn.

* Fellow A.P.H.A.
† Member A.P.H.A.

IRWIN GRANNISS, M.D.,† Saybrook, Conn., has been made Health Officer of the Borough of Fenwick, Old Saybrook.

STANLEY H. OSBORN, M.D., C.P.H.,* was recently reappointed by Governor Hurley of Connecticut as State Commissioner of Health for a term of six years. Dr. Osborn has been in his present position since 1922. The appointment, effective July 1, requires no legislative confirmation.

Southern States

AUBREY A. ADEN, M.D., Yazoo City, Miss., has been appointed Health Officer of the Benton-Tippah Health Unit.

JOHN O. BARFIELD, M.D.,† formerly of Miami and Apalachicola, Fla., has been appointed Director of the City-County Health Department at Panama City.

LEE SCOTT BARKSDALE, M.D., of Hopewell, Va., has resigned as health officer to enter private practice.

ADRIAN L. CARSON, JR., M.D.,* Acting Head of the Bureau of Maternal and Child Health in the State Department of Health, Richmond, Va., since the retirement of Dr. Bathurst B. Bagby, in July, 1940, has been made full Director of that Bureau. Previously, he was a member of the staff.

WILLIAM W. CARTER, M.D., of Corsicana, Tex., has succeeded DR. OTHO C. BOWMER as Health Officer of Navarro County.

CLIFFORD B. COLE, M.D., of Dyersburg, Tenn., has been appointed Health Officer of Fayette County to succeed DR. HENRY N. MOORE, Somerville, who resigned to enter private practice.

LELAND H. DAME, M.D.,† of Jasper, Fla., has been appointed Health Officer for Highlands and Glades Counties, succeeding DR. ERWIN F. HOFFMAN, of Sebring, who resigned.

JEWEL G. GAINEY, M.D., formerly of Blountstown, Fla., has been named Commissioner of Health of Muscogee County with offices in Columbus.

GEORGE E. GIBBONS, M.D., has been appointed Health Officer of the Noxubee County, Miss., Health Unit.

GEORGE A. GRAY, M.D.,† Sweetwater, Tex., recently director of the Sweetwater-Nolan County Health Unit, has been appointed Director of a new unit for Abilene and Taylor County.

CHARLES W. HARWELL, M.D., has been named Health Commissioner of Crisp County, Cordele, Ga.

HERBERT A. HUDGINS, M.D.,† Winston-Salem, N. C., has been elected Health Officer of the Rutherford-Polk health district.

WILLIAM K. MCDOWELL, M.D.,† Scotland Neck, N. C., has been appointed Health Officer of Richmond County with headquarters at Rockingham.

JULIAN T. MILLER, M.D., has resigned as Health Officer of Portsmouth, Va.

LARIED S. OATES, M.D., of Center, Tex., has been appointed Health Officer of Shelby County to succeed DR. WILLIAM SPENCER WARREN, of Center.

THOMAS J. PENNINGTON, M.D., has been named Health Officer of Nacogdoches County, Tex.

WILLIAM H. PICKETT, M.D.,* of Jacksonville, Fla., Assistant State Health Officer, has been appointed State Health Officer to fill the unexpired term of DR. ALBERT B. MCCREARY, who died.

JOHN C. POWELL, M.D., Coldwater, Miss., has been appointed Health Officer of Prentiss County.

JAMES STEWART, M.D., Jefferson City, Mo., physician, formerly of St. Louis, was appointed State Health Commissioner, to succeed DR. HARRY F. PARKER. Dr. Stewart was State

* Fellow A.P.H.A.
† Member A.P.H.A.

Health Commissioner from 1925 to 1933.

RALPH E. WEDDINGTON, M.D.,† Fort Smith, Ark., has been appointed Health Officer of Independence County, succeeding DR. GARDNER H. LANDERS, Batesville, who resigned to join the military forces.

MYRON E. WEGMAN, M.D.,† pediatric consultant of the Bureau of Child Hygiene of the Maryland State Department of Health since 1936, has resigned to accept an appointment as Assistant Professor of Child Hygiene, in the School of Tropical Medicine, of the University of Puerto Rico, under the auspices of Columbia University, New York, and as Assistant Director of the Division of Education and Research, in charge of Child Hygiene, in the Insular Department of Health.

FRANK E. WILSON, M.D.,† Tarboro, N. C., has resigned as Health Officer of Edgecombe County to take a course in public health at the University of North Carolina.

HARRY E. WRIGHT, M.D., formerly of Dallas, Tex., has been appointed Health Officer of Marshall County, Tenn.

Western States

CHARLOTTE SINGER BROOKS, M.D., has joined the staff of the Santa Barbara County, Calif., Health Department as Assistant Medical Officer after receiving her public health degree.

CECIL R. FARGHER, M.D.,* of Vancouver, Wash., has been named Health Officer of Vancouver and of Clark County.

THOMAS D. ROBERTSON, M.D., of Portland, Ore., has been appointed a member of the State Board of Health to succeed the late DR. ROY A. PAYNE.

Deaths

GEORGE ALEXANDER GORDON, M.D., of Hamilton, Mont., former Health Officer, died on February 24.

HENRY H. SUGG, M.D., of Mount Vernon, Ind., formerly Secretary of the Board of Health, and County Health Officer, died on March 4.

HENRY EDMUND VITOU, M.D., of South Bend, Ind., former Health Officer, and for many years a member of the city Board of Health, died on February 15.

* Fellow A.P.H.A.
† Member A.P.H.A.

CONFERENCES AND DATES

American Association of Public Health Dentists. Annual Meeting. Lamar Hotel, Houston, Tex. October 26–28.

American College of Surgeons. Hotel Statler, Boston, Mass. November 3–7.

American Congress of Physical Therapy—20th Annual Scientific and Clinical Session. The Mayflower Hotel, Washington, D. C. September 1–5.

American Dietetic Association—24th Annual Convention. Hotel Jefferson, St. Louis, Mo. October 20–23.

American Hospital Association. Atlantic City, N. J. September 15–19.

American Physiotherapy Association — 20th Annual Conference. Lagunta Court, Stanford University, Calif. July 13–18. (Graduate Program in Physical Therapy, sponsored by the American Physiotherapy Association. Stanford University Medical School, San Francisco, Calif. June 23–July 18.)

American Public Health Association—70th Annual Meeting. Convention Hall, Atlantic City, N. J. October 14–17.

American Society of Civil Engineers—Summer Meeting. San Diego, Calif. July 23–25.

American Water Works Association—
Western Pennsylvania Section—Lawrence Hotel, Erie, Pa. August 7–9.
New York Section—Hotel Queensbury, Glens Falls, N. Y. September 11–12.
Rocky Mountain Section—Lafonda Hotel, Santa Fe, N. M. September 18–19.